THE HEALTH EDUCATION JOURNAL

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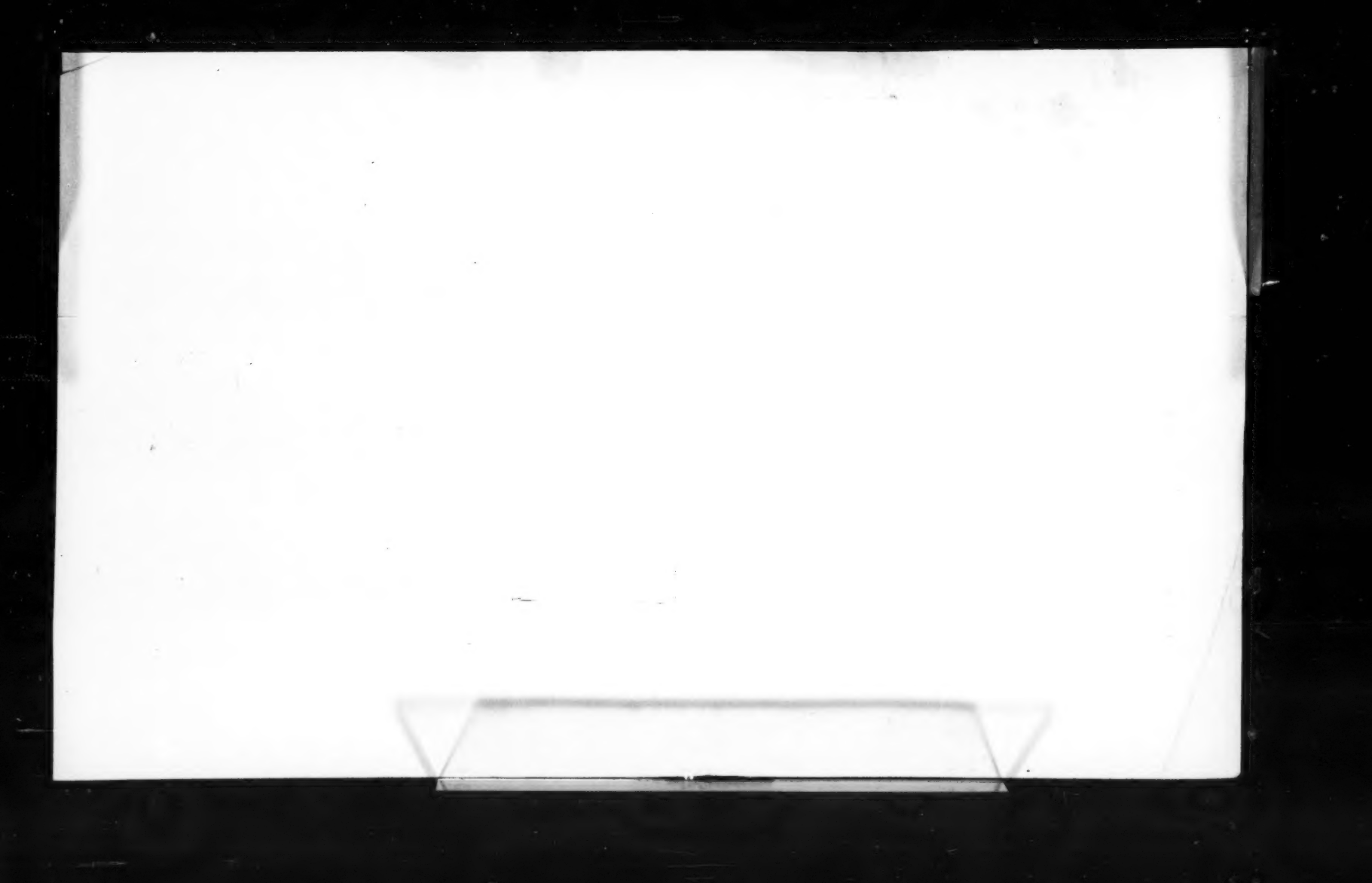
THE CENTRAL COUNCIL FOR HEALTH EDUCATION



THE

Health Education Journal

A QUARTERLY FOR ALL WHO ARE INTERESTED IN HEALTH

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THE CENTRAL COUNCIL FOR HEALTH EDUCATION

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A staff of officers is employed by the Council to provide expert advice to cover each of these principal activities.

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HEALTH EDUCATION IN SCOTLAND

The Secretary of State for Scotland recognises the Scottish Council for Health Education as the responsible body for assisting Local Authorities in Scotland, and inquiries concerning health education in Scotland should be made to the Secretary and Treasurer, The Scottish Council for Health Education, 3, Castle Street, Edinburgh, 2.

SCIENCE AND THE SOUTH BANK

THERE can be little doubt that the great Festival has captured the imagination of the great public. Daily tens of thousands of people of all nationalities and every level of appreciation are being confronted with examples of the high peaks of man's ingenuity of thought and creation.

The Scientific Exhibits at once place certain facts on record with a degree of force that few can resist. The first is the degree to which we of the twentieth century are immersed in the philosophy of science; the second, how heavily biased this philosophy is towards the physical and technological sciences; and finally, how inadequate are the means of communication between the scientists and the laymen.

Crossing the delicate Bailey Bridge, we leave the grandfather world of iron and steam, of tram and soot and opportunism, and enter a neo-technical world of aluminium and enzymes, of atomic power, radar and exact planning. The two worlds which face each other across the Thames are as different as Queen Victoria's England from that of Queen Boadicea. Perhaps the outstanding virtue of such an exhibition is to allow our generation to acquaint itself with the future that lies immediately ahead and ask itself whether it is spiritually and administratively prepared to face up to and master the problems that it will present.

The design and construction of the buildings summarise, as architecture always has done in the past, the views of the leading minds of the day. It is a clean, hard, ingenious world, in which the intellect ranks high, in which planning is precise, and in which the delights of the eye and heart are catered for but on a strictly limited scale. Sentiment has been finally dethroned from its mysterious leadership in human motives and placed among the measurable requirements of psychology—something to be humoured in details but not a serious guide to action. The monumental is absent, the efficient all-pervading. Pope might have said " Correctly cold and regularly low ". But this would not be fair. Emerging from this new aesthetic is a true classical feeling befitting the sceptical faith of which this exhibition is the embodiment.

Science says: this is what we have found—take it or leave it. And the layman is left to fend for himself in an unfamiliar country. Unfamiliar and frightening to many, for these glimpses of an expanding universe destroy familiar ways of thinking. Faith in the forces locked in the vitals of an atom implies no human purpose and provides no moral straw at which we can clutch. For this new world, for which few of us are trained, new moral concepts must be forged implying degrees of co-operation and organisation of which we are now only dimly aware.

The first feature which impresses us is the all-pervading nature of scientific enquiry and the degree to which the direction of our life is already determined by scientific thinking. And yet how inadequate these concepts still are when dealing with human beings. One becomes aware that the predominating place which the physical and mechanical sciences hold in this exhibition reflects the real balance of power between the human and technological interests of our civilisation. This is certainly a fair quantitative assessment of discovery and may be a fair estimate of what still remains to be discovered, but it is not a useful emphasis from the point of view of men trying to solve their human problems.

It is remarkable, for instance, that psychology receives but scant attention in any of the sections. Though our authors from Chaucer and Shakespeare to the designers of the Pavilion of the Lion and and Unicorn itself are given full credit for the accuracy of their intuitive perception of human nature, the scientific sections provide only trivial

mechanistic evidence that psychology is a science at all. This is a measure of the challenge which the juggernaut of a scientific civilisation presents to those concerned with human beings.

Even in the pavilion devoted to health the main accent is clearly on the emergence of scientific medicine and the tools with which it works. Though the exhibition succeeds in this respect, it fails completely to give an impression of the multiple factors on which physical and emotional health depends or to convey to the observer what he himself can do to preserve and improve his own and his family's health. We are left rather with the impression that adequate sewerage is still the solution to our major preventive problems, which we consider is an inappropriate use of the art of understatement in view of the catering horrors that surround us.

It is always easier for the critic than for the creator. Indeed, it has been wisely remarked that the only worthy criticism is superior action. This very inadequacy on the side of human and preventive questions may be due to one of three things: a lack of precise knowledge on the part of scientists, which we know to exist (but not to the extent here displayed); a lack of appreciation of the value of preserving health, which is constantly forced upon our attention even by acts of parliament; and thirdly, a factor of great importance to us who work in health education, the immense difficulty which the scientist now has in communicating with his fellow men. Perhaps this is the aspect of the exhibition which we should most consider.

Are our scientific ideas communicable to laymen? Are laymen being educated in the grammar of science?

It is clear from studying the exhibits and reading the captions on many of the exhibits that the problem has not engaged the attention of the designers sufficiently.

In some cases necessary captioning or explanation is absent, and in some the vocabulary is obscure. There remains, however, the most difficult problem of all, which is that the concepts involved are often too unfamiliar and too complex even for those with a moderate scientific education to comprehend.

These are not criticisms confined to this particular exhibition but are the major anxieties of anyone attempting scientific exposition and have a direct application to Health Education.

The first is only remediable if scientists cultivate the art and the method of the great expounders in word and picture such as Shakespeare and Tolstoy, Walt Disney and the daily newspaper. This would require more than a schoolboy's acquaintance with the discipline of exposition. It is significant indeed that there are few who have given serious attention to this study and that to our humble knowledge there is only one textbook which devotes itself to this subject.* Where this art has been acquired, as in such contemporary writers as Hogben and Hoyle, and to a remarkable extent by this exhibition, the imagination of the layman has been powerfully stimulated and the way been opened for tackling the third great problem.

The difficulty of bridging the gap between the conceptions of modern science and modern folk lore is immense. The one is built up on empiricism and the other on a morality which in many cases bears the imprint of mediaeval mysticism.

It is indeed hard to understand the one philosophy with the mental outlook of the other, and that is what we are asking people to do. This raises the question immediately whether our schools are teaching children the grammar of science, whether Health Education is equipping children in schools and adults, both sick and well, to grasp and use the powerful tools which lie to hand. Without scientific comprehension and feeling towards health, are we likely to travel far and fast towards the goal of eliminating preventable illness and suffering?

**The Presentation of Technical Information*, by R. O. Kapp.

BRINGING HEALTH TO THE PEOPLE

By S. LEFF, M.D., D.P.H.,
Barrister-at-Law, Medical Officer of Health, Borough of Willesden.

THE Borough of Willesden, like every other area, has its thousands of citizens who pay their rates and go their ways with only the vaguest picture of what the local services provide for their health and welfare. Events occur in their individual experience which give rise to doubts and queries that all too often are left unanswered. People, in fact, tend to feel there is a wide gulf between themselves and the authorities who make the wheels go round. The large problems of administration and the small individual problems are not generally seen in relation to each other; and because of this, both the public and the administrators are the losers.

In the past year, the Willesden Health Department has made a determined effort to break down this remoteness; the efficient work of the department, it is considered, depends upon the understanding and co-operation of the public. And as the mountain won't come to Mohammet, Mohammet has gone to the mountain, with mutually stimulating results.

What are the available methods of contacting the public? Through the clinics, where mothers are used to getting together; through the nurseries, where parents' clubs have been encouraged, and flourish; through all sorts of local organisations, likely and unlikely; and most interesting and rewarding of all, direct to the coming generation through the schools.

Are the people interested in Health?

In all, over five hundred lectures, informal talks, brains trusts and film shows have been given during the year. A team of doctors, dentists, and health visitors, together with the chief sanitary inspector and the deputy borough engineer and surveyor, have given 259 talks in 17 Willesden schools. Classes are often combined, and the lecturers meet from 30 to 130 pupils on each occasion.

Is this informal addition to the school curriculum popular with the children? From all the accounts of the people who give the film-lectures,

the answer is decidedly yes. Here are two comments which speak for themselves:

> "Memo. from Asst. M.O. to M.O.H. re Film Talks. Herewith more questions received after my talk yesterday—one from a studious youth with all the signs of becoming a future eminent physician. Once again I had a cordial reception from about 100 boys."

and this,

> "Memo from Asst. M.O. to M.O.H. re Film Show that was to be given to a Secondary Modern School.
> Next Tuesday is Empire Day—half-holiday. But children were very disappointed to be told there would not be any films. Will we show them at a later date?"

Most revealing of all has been the quantity and quality of the questions put by the children who have attended these lectures. The films are always followed with the closest attention, and the lecturer has to be well up in the subject to answer satisfactorily the searching questions which result. Subjects such as tuberculosis, diphtheria, proper feeding, proper sleep, have more than an academic interest for these children. They are quick to relate the teaching to their own lives and experience and have a natural interest in maintaining their own health and in learning about the standards necessary for proper well-being. Other types of talks elicit questions covering a very wide range, from the succinct " Whot corses ecups?" to the profound " Would atomic bombs affect men's brains?"

It is very interesting to see some of the ideas that unfold in these young minds, and as many of them have not the advantage, or otherwise, of having had any previous training, their response is sometimes novel; but at least it shows ingenuity and the capacity to think out things for themselves. The following is an example.

The subject of a film talk was diphtheria immunisation, and the audience about 100 grammar school children, aged twelve years. The question and answer technique is used as it helps to stimulate the pupils to take an active part in the discussion.

Diphtheria antitoxin and its manufacture had been explained and the reason given for the use of a horse for collection of serum was its size. A boy then asked, quite seriously, why not use an elephant. The question was referred back to the class and a bright boy suggested that the reason why the elephant could not be used was that his skin was too thick to take a needle.

Many questions throw a light on the background and real-life problems of the child, such as the one " Can you cure a person of fits? He got sun stroke." It is a source of satisfaction to think that many a worrying misconception has been cleared up by a simple question and answer in the course of these film-talks; a worry which might otherwise have rankled for years in the child's mind. For that alone, the effort has been worth while. But from all the hundreds of questions which are now on record in the files of the Willesden Health Department, one thing stands out most clearly, and that is the great hunger which the children have for information about positive health. It is also clear that by satisfying this need at this stage, valuable work is being done in the training of health-conscious citizens for the future.

Contacting the Adult

Bringing knowledge on health matters to the adults has taken a similar, if more varied, course. Last year 16 film shows, 47 talks and 27 social meetings were held for the parents of the day nurseries. These were planned to take place when the parents called to collect the children, and the children on these occasions were given a special treat of ice-cream and tea, while the parents had the opportunity of talking to the officials of the health committee. In this way problems affecting both parties could be discussed and viewed from other than the usual point of view. Mothers were able to put problems that until now they had not had answered. Why did children have to leave the nursery at five years of age? Why were there no play centres for children during school holidays? and many others. In return the parents heard of some of the administrative and financial difficulties involved. There could be no better way of encouraging co-operation, which is certainly essential for the health and happiness of the children and for the welfare of the community as a whole.

In addition to the nursery meetings, over a hundred talks under the general heading of " Mothercraft " have been given in the three clinics in the borough, 73 by doctors and 57 by health visitors. The result has been an increased interest shown by all concerned, the mothers, the lecturers and the staff, who also have their own monthly staff meetings in order to keep their information up-to-date. The medical and nursing staff visit the central hospital twice a month for refresher demonstrations, and the newest theories and treatments are explained and discussed.

An interesting sidelight on this comprehensive scheme for health education in Willesden is the fact that local organisations such as the British Legion social clubs and other community associations and trade union branches are now writing in to the Health Department with requests to be included in the scheme. Over sixty talks have already been given

to such organisations, and the type of question put and the interest shown prove that amongst adults no less than with the children there is a deep interest in health matters, and a desire to be correctly informed.

Using the Outside World

Another form of education for health has been the planning of visits by schools to local places of interest, such as food factories, hospitals, clinics, etc. This has been done by co-operation between the school and the health department, and the value to the children of such outings is beyond question. In fact, the manager of a certain pasteurisation plant remarked afterwards that the children had put questions to him on the subject which he had found difficult to answer adequately. Of course the children had the advantage over him as they had previously been shown a film and been given a lecture on pasteurisation! There is no doubt that this combination of theory and practical experience is an excellent form of education and one of the best ways of training the young adult to have an intelligent approach to the real world in which he will work. In the meantime, it is mainly the pupils of secondary modern schools who are being given this type of health education, but an effort is being made to draw in the grammar school children as well.

Of course, it was not enough to plan these activities. The interest and enthusiasm of teachers, doctors, health-lecturers and others concerned had to be won. In all cases a personal approach has been made to the Head Master, and it was worth while in this way to discuss individual points of difference; many teachers feel that specially trained health-workers are more suited to give school-children talks on hygiene, and this has been a useful point of contact from which to work. In every case, the results of the talks and the response of the children has won the desired enthusiasm for this health scheme.

Health Department and Community

From the point of view of the adult population, all these various forms of health education into which they are being drawn have one valuable aim—to bring closer all the people concerned in the well-being of the area: patients, general practitioners, and health workers, and the population as a whole. In fact, the way is being prepared for the time when the overcrowded surgeries will be replaced by spacious health-centres, towards which the people will naturally turn for preventive as well as curative medicine. An essential factor in such a situation would be the confidence and understanding which the public and the general practitioner would share. We have not yet got the health centres, but we are on the way to building up the greater interest and understanding of health matters which is so essential.

The scheme, so far as it has progressed, has well rewarded all those who have worked so hard to get it across to the people. It is planned, of course, to extend and widen the scope of all the activities which have already proved to fulfil a need in the Borough. On a subject of vital importance, for example diphtheria immunisation, where excellent advertising campaigns have been carried out in the past, new methods will be tried out, with the object of drawing a larger number of people than ever before into this essential service. Similarly with the provision of cod-liver oil and vitamins. There always has to be a constant appeal to the imagination and understanding of the public, and the Health Department is determined to keep up the effort and try out every way that will bring in the results. It would be interesting to have some way of measuring the effectiveness of one form of education against another, but there is no doubt that in the long run all these ways of making the people health-conscious have a cumulative effect.

BIOGRAPHICAL NOTES

W. E. FLOOD, M.A., Ph.D.—Lecturer in Education, Birmingham University. Taught science in secondary schools for fourteen years, and immediately after the war joined the staff of Birmingham University, where he is mainly concerned with the methods of teaching science and the training of science teachers. Is specially interested in the popularisation of science and was awarded the degree of Ph.D. for work in this field. Has studied the problems of vocabulary in particular, and devised a minimum vocabulary of scientific words essential for the popular exposition of science. Author of a number of elementary science books, some within the special limited vocabulary.

S. LEFF, M.D., D.P.H., Barrister-at-Law—Medical Officer of Health, Borough of Willesden. Author of *Health of the People* (Gollancz).

POPULAR INTERESTS IN SCIENCE

By W. E. Flood, M.A., Ph.D.
Lecturer in Education, University of Birmingham.

The rapid expansion of science during the last fifty years has created many problems. Not the least of these problems is the growth of a gap between the ordinary man and the professional scientist. Science determines what we eat, what we wear, what work we do, where we do it, indeed it largely determines the very nature of our familiar life and society. Yet the ordinary man is singularly ignorant of science. Science has made such strides that the schools can do no more than lay a bare foundation of knowledge on which the future adult may build (if he is encouraged to do so), while those who left school some number of years ago find that changes in human life and knowledge have outstripped their education. We are faced with the anomaly of a scientifically shaped existence and a scientifically ignorant public.

The gap between the ordinary man and the professional scientist has, of course, long been recognised and steps have been taken to close it. Books and periodicals of " popular science," varying widely in quality, appear in the bookshops, semi-popular lectures are provided by such bodies as the Workers' Educational Association, and, at last, science appears to have a regular place in the wireless programmes. But, strangely, little study has been made of the techniques of exposition of popular science. How, for example, should an author choose and present his material so that the ordinary man will enjoy reading it, will understand it, and appreciate its importance? It is this field of study which is of particular interest to me, and in this article an account is given of a little experiment which I conducted a year or two ago.

As every teacher knows, a lesson must be based on, or grow from, the interests of the pupils if it is to be successful. So too if we would " teach" science to adults, i.e., help them towards an intelligent understanding of science, we must begin with topics which they find interesting. But in what scientific topics are ordinary people most interested? Suppose we are planning a 15 minute radio talk or a short article for a magazine.

Would people be interested in, say, blood transfusion, in the cyclotron, or in the structure of the sun? The determination of people's interests is of fundamental importance in the popularisation of science. My experiment was an attempt to make such a determination, and the results, it is thought, may interest readers of this journal.

Spheres of Interest

In order to examine people's interests in the various branches of science we need an appropriate classification of these branches. The conventional classification into physics, chemistry, biology, astronomy, and so on, is by no means suitable for the purpose. A person may be interested in heredity and yet deny an interest in pure biology; he may be interested in colour photography and yet be bored by classical optics. The classification must be rather of spheres of interest than of conventional subjects. But, as it is to be used for tests, it must not contain an unreasonable number of items. With a certain amount of preliminary experimenting, a classification of twenty-three " subjects " was devised. These subjects are set out in the table on p. 161. A few of them, perhaps, require a little explanation. Fundamentals (3) covers the ordinary textbook material which a student learns at a school or college. Mr. Everyman often asks: How is it made? and How does it work? These are covered by the headings Industrial Applications (6) and Mechanical and Electrical Applications (7) respectively. The science of Everyday Things (8), which was meant to include such matters as cameras, hair-clippers, vacuum cleaners and household detergents, has rather ill-defined boundaries. The later headings 20-23 cover matters which, on occasion, form the subjects of talks and magazine articles—discussions *about* science rather than discussions *in* science. Future Advances, for example, includes the unsolved problems of science—the problems on which scientists are now engaged, what they are hoping to achieve, and why. (In any similar investigation it might be useful to add two more headings: Scientific Method and Philosophy, and, unfortunately, Science in Warfare.)

Finding a Representative Group

It is fairly easy when carrying out tests with school children to secure the co-operation of a large, representative number of examinees, but it is much more difficult to enlist the help of a large number of adults, especially when one wishes the adults to form a true sample of any particular section of the community. The readers of a certain book or magazine might form a satisfactory group but, unfortunately, one could not be sure that the replies received from them were representative of the group; perhaps only the " cranks " and those with " bees in their bonnets " would bother to provide information. It seemed that a satisfactory group,

at least for initial study, could be formed from all the adults who voluntarily attend lecture-courses in popular science, e.g., the courses provided by the Workers' Education Association and the extra-mural departments of the universities. Such people, of course, are not typical of the whole community, for they have such an interest in science that they give up their leisure time to attend lectures, but one could be sure of getting a truly representative section of these people. Further, it seemed more profitable at this stage to study the interests of those people who profess some liking for science rather than to force a test on people to whom science is, at the best, a closed book.

As readers may be aware, science classes are relatively few and attendances often small. Ultimately a group of about 400 people (241 males, 150 females) was constructed. All kinds of science classes (e.g. biology, astronomy, general science), in all geographical areas of the country, were included. The wide range of ages (from under 20 to over 70) and the diversity of occupations (including coal miners, teachers, engine-drivers and bank clerks) showed that a representative sample had been taken.

The Questionnaire

The twenty-three subjects were set out on a test-sheet with a two line explanation of each so that the nature and content of each subject was clear. The instruction was given that each subject was to be marked with one of the letters A, B, C, D or E. The letters were to denote the following degrees of interest: A—This interests me very much indeed, B—This is quite interesting, C—This is of moderate interest, D—This would not interest me much, E—This does not interest me at all. When all the test-sheets had been collected statistical tests were applied to check that the degrees of the scale had been similarly interpreted.

The primary purpose of the investigation was to examine the differences of interest in the various subjects. Are men more interested in astronomy than in biology? Does the history of science appeal more to men than to women? Do people prefer talks on vitamins to talks on weather-forecasting? The interest in each subject was indicated on the test-sheets by so many A's, so many B's, ... so many E's. The nature of the voting for each subject was compared with that for every other subject by statistical methods. Similarly the male interest in any subject was compared with the female interest in that subject. We need not discuss these lengthy calculations here. In the table below the results are presented in a simple, numerical form. The numbers may be regarded as " marks out of ten." A mark of 10 would denote that everyone gave an A vote to that subject and a mark 0 would denote that everyone gave an E vote to that subject. A mark of 7½, corresponding to an all-round average of B, indicates a very strong interest in that subject.

Interest scores in 23 scientific subjects

No.	*Subject*	*Males*	*Females*	*All students*
1	History of science	5·5	5·2	5·4
2	Scientific biography	5·0	6·2	5·5
3	Fundamentals of physics and chemistry	4·8	3·9	4·4
4	New discoveries and theories	7·4	6·7	7·1
5	New scientific devices	6·3	5·8	6·1
6	Applications of science to industry	7·2	7·0	7·2
7	Mechanical and electrical applications	5·7	3·0	4·7
8	Science of everyday things	6·5	6·9	6·6
9	Civil engineering	5·0	3·4	4·4
10	Medicine, disease and health	7·2	8·5	7·7
11	Pure (" non-useful ") biology	6·2	8·3	7·0
12	Applied biology and agriculture	6·3	7·3	6·7
13	Ethnology and anthropology	5·6	7·3	6·2
14	Psychology	6·6	8·1	7·2
15	Aeronautics	3·5	2·4	3·1
16	Astronomy	6·7	6·8	6·7
17	Geology	6·0	6·4	6·1
18	Meteorology	5·7	6·6	6·1
19	Wireless and television	5·2	4·2	4·8
20	Methods of teaching science	4·0	4·5	4·2
21	Public use, control and direction of science	4·8	4·6	5·1
22	Work of institutions; surveys, reports	3·8	4·1	3·9
23	Future advances	7·7	7·0	7·4

Results

Before we can draw any conclusions from the table we must know the smallest difference between two marks which may be regarded as significant. In the above table, differences may be regarded as real if they are not smaller than 0·8 for the males, 1·0 for the females, and 0·6 for the whole group. Thus males are more interested in Medicine and health than in Pure biology (difference 1·0) but we cannot be sure that the apparent difference between the marks for Medicine and health and for Future advances (0·5) is significant. Similarly, we can rely on differences of 0·9 (or more) between the sexes; thus, for example, we are sure that females are more interested than males in psychology.

We cannot here comment on all the results of the experiment nor indeed is it necessary, for each reader will pick out the results of particular interest to him. The overall averages for the two sexes are almost identical. But it must be remembered that the males and females forming the group voluntarily attended the same classes and, presumably, were equally interested in science; we cannot conclude that *in general* females are as interested in science as males. We see, however, that females are more extreme in their preferences and dislikes. Their marks range from 8·5 to 2·4 while those for the males range from 7·7 to 3·5. Possibly this difference between the sexes can be explained on psychological grounds.

Males put Future advances and New discoveries and theories at the top of the list with Medicine and health and Industrial applications closely behind. As readers of this journal will have quickly noticed, females put Medicine and health at the top of the list, closely followed by Pure biology and Psychology. These three have very high marks. It is interesting, though perhaps surprising, to find that both males and females have no great interest in aeronautics.

We find that the public direction and use of science is not considered very interesting—that is, by the people who undertook the test. Of even less interest is the work of scientific institutions and the results of scientific surveys and commissions. This may indicate that the ordinary man is not fully conscious of the impacts of science on communal life or, perhaps, is little interested in the development of society as distinct from the individual. On the other hand the results may indicate no more than that adults who give up time to listen to science lectures prefer the subject to be science pure and simple.

When we compare the sexes we find some particularly interesting results. Relatively, males are more interested in the mechanical and occupational subjects such as wireless and mechanical and civil engineering. This is in keeping with what we might have expected. The female interest is relatively higher in all subjects which deal with Life. (Notice even the higher mark for biography.) The great feminine interest in living things, in their physical, biological and psychological aspects, is one of the most striking results of the enquiry.

The results of the test were also examined in an attempt to detect any variation of interest with age. As, however, the number of people in any selected age-group was small, little reliable information could be obtained. One striking result did emerge. Females between the ages of 20 and 40 were very " violent " in their likes and dislikes; the marks ranged from 9·2 to 2·2. The very high mark of 9·2 was given to psychology. Medicine and health came next with the high mark of 8·7.

It would be dangerous to generalise from the results of this experi-

ment, for the group which was examined was not necessarily representative of the public as a whole. Some confirmation, however, was obtained by conducting the experiment with a group of men in an Army Education College. Although these men were not necessarily interested in science at all, their likes and dislikes were very similar to those of the younger men in the original group. The top mark (7·7) was given to New devices with Medicine and health a good second (7·4).

If we permit ourselves to take the results as at least suggestive of the relative popularity of the various branches of science, we can judge the suitability of the science material which is commonly offered for popular instruction. Many magazines seem to lay too much emphasis on the physical sciences (though these often involve new discoveries and devices) and tend to underestimate the interest and importance of the biological sciences. On the other hand, lecture courses (e.g. those provided by the W.E.A.) seem to give biology an undue prominence. (Possibly it is thought that biology, at an elementary level, requires little previous training in science while the physical sciences demand a deeper knowledge of fundamentals.) Two subjects have been shown to be of particular importance: psychology and health. Many organising bodies provide classes in psychology but few attempt to devise courses on health. Popular science books and magazines tend to ignore both sciences.

Readers may make further deductions from the results. Some, perhaps, will be encouraged to make further experiments themselves. The presentation of science to the ordinary man is an intriguing field for research. It is also a very important field. It has been truly said "It is no use improving the knowledge that scientists have about each other's work if we do not at the same time see that a real understanding of science becomes part of the common life of our times." (J. D. Bernal).

MILESTONES IN MEDICINE

16. Other Surgeons of The Renaissance.

By E. ASHWORTH UNDERWOOD, M.A., B.Sc., M.D., D.P.H., F.L.S., *Director, The Wellcome Historical Medical Museum; Hon. Lecturer, University of London.*

ALTHOUGH the methods of Ambroise Paré came ultimately to dominate the surgery of the Renaissance, there were other surgeons who had a following, and who in special fields sometimes opened up new paths. When considering them it may be well to bear in mind that Paré's first surgical work, his *Method of Treating Wounds*, was published in 1545, and that the first edition of his *Complete Works* appeared in French in 1575.

On the sea-front of the delightful little town of Rapallo on the Italian Riviera there is a statue of Giovanni da Vigo, or John of Vigo, who was the medical attendant to Pope Julius II. Julius was a war-like pope, and Vigo accompanied him on his many campaigns. Gunpowder had then come into its own, and gunshot wounds were by that time recognised as being difficult to cure, since, apart from any other factor, they were often poisoned. Vigo was born in 1460, and when he was fifty-four he set down the results of his great experience of war-wounds in a work entitled *A copious practice in the art of surgery*. In his treatment Vigo recommended the use of the actual cautery, or alternatively of "oil of elder boiling hot", to prevent the poisoning of gunshot wounds. This latter method was immediately accepted. Between its publication in 1514 and 1544 Vigo's book passed through over twenty editions, besides translations. It will be recalled that it was in 1536 that Paré almost by accident abandoned this barbarous method in favour of more soothing dressings.

Reference was made in a previous article in this series to the merits of Berengar da Carpi (1470-1550) as an anatomist. Berengar was a professor at Bologna, and his fame was so great that he was called as far afield as Venice to treat patients. He also treated the famous Florentine goldsmith, Benvenuto Cellini, who refers to Berengar in his Autobiography. In this celebrated book Cellini tells us that when Berengar visited Rome, Pope Julius II "would fain have had him in his service, but he replied that he would not take service with anybody in the world and that those who had

Fig. 1. Treatment of an arrow wound on the field of battle. From the *Chirurgiae* of Giovanni Andrea della Croce. Venice, 1573.

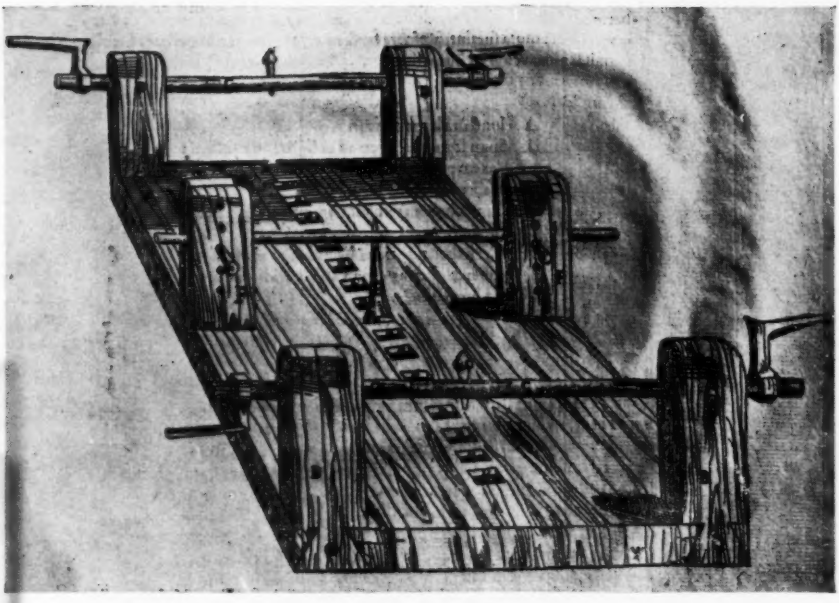

Fig. 2. The "Scamnum Hippocratis" (Hippocratic Bench), as illustrated by Guido Guidi (*Chirurgiae*, 1554).

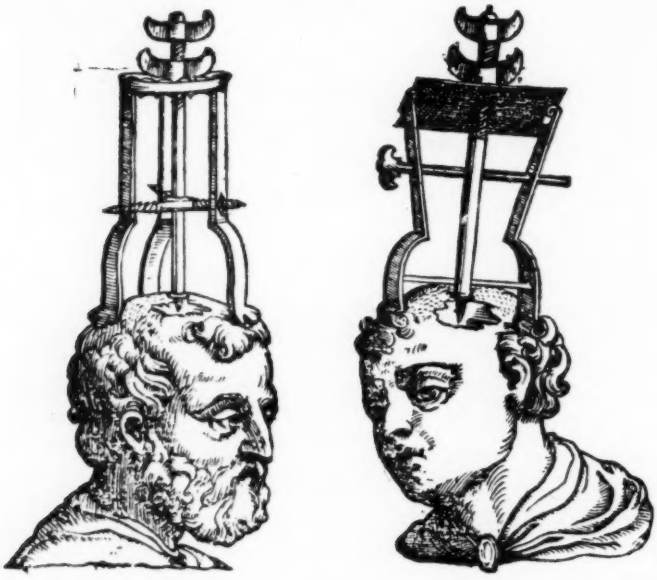

Fig. 3. Trephining the skull. Illustration from the *Chirurgiae* of Andrea della Croce, Venice, 1573.

need of him might come to seek him out". In 1517 Berengar treated Lorenzo de' Medici for a head injury, and in the following year he published his *Treatise on Fracture of the Skull.* This book is well known, but it does not really have much new to say on the subject.

Just about the time when Ambroise Paré, as a youth of twenty, was settling down to his service in the Hôtel-Dieu at Paris, the Collège de France was established in that city (1530), and it was decided to call in a famous surgeon to organise the medical faculty. The man chosen was Vidus Vidius, or Giudo Guidi (1500-1569), who was already a famous physician at Florence. He carried out the organisation so rapidly and successfully that the wits said—in Latin, of course—that " Vidus Vidius came, saw, and conquered." He did not do so much without arousing antagonism; but he was soon recalled to become professor of philosophy and medicine at Pisa. Guido is an interesting character. He wrote a work on ancient surgery (1544), and in it he extols, among other instruments used by the ancient Greeks, the "scamnum Hippocratis" or Hippocratic bench which was recommended by the Greeks for the reduction of fractures and dislocations. This bench, which looks something like the rack used in medieval tortures, was figured by Guido, and a number of examples were made. The only specimen which is known to have survived is now in the Wellcome Historical Museum.

Giovanni Andrea della Croce, a Venetian surgeon, published in 1573 a work on surgery which dealt largely with gunshot wounds and the trephining of the skull. His illustrations of the instruments used for this operation are well known. He practised the methods of treating gunshot wounds which were recommended by Paré. Another famous Italian surgeon, Fabricius ab Aquapendente, has been mentioned in a preceding article in another connexion. Fabricius, in addition to being a very distinguished anatomist and embryologist, was a careful conservative surgeon who used the knife only when it could not be avoided. Under his influence the school of Padua became the Mecca to which all serious students of anatomy and surgery proceeded for their training. Fabricius published a surgical work called the *Pentateuchos chirurgicum* (1592), which was his lectures on surgery in the Paduan school. This work appears to have been edited by another person from notes taken at the lectures, and to have been published contrary to the wishes of Fabricius. However, twenty-five years later, when Fabricius was nearing the end of his long life, he himself published his *Surgical Works* (1617). This book described his orthopaedic apparatus for the treatment of wry neck, for curvature of the spine, and for deformities of the feet. He described new methods for performing tracheotomy and for tapping the chest, and he was a pioneer in the surgery of the urethra. His work on the ligation of arteries was also important.

Turning from Italy, mention may be made of Felix Würtz of Zürich, who dealt mainly with "non-cutting" forms of surgery, such as the treatment of fractures and dislocations. In his *Practica der Wundartzney* (1563) he was the first in German-speaking countries to combat the treatment of wounds with the cautery and messy ointments. In France there were two surgeons of outstanding importance in addition to Paré. Pierre Franco was a Huguenot from Provence who spent most of his life in Switzerland. He picked up the craft of rude surgery from the itinerant quacks to whom operations for hernia, for the stone and for cataract were left by the surgeons in these days. Franco became the greatest lithotomist of the century, and he introduced the suprapubic method, which was especially useful in children. His operation for hernia, apart from minor modifications, was practically the modern operation. On the Continent the surgery of the sixteenth century closes with Jacques Guillemeau (1550-1613), who was the pupil and son-in-law of Paré, and who became the surgeon to three French sovereigns. Guillemeau followed Paré in treating traumatic aneurysms by application of one ligature only (above the aneurysm) and then evacuating the contents. Previous workers had applied a ligature above and below the aneurysm. Guillemeau was also noted for his work as an eye-surgeon and as an obstetrician. His *Chirurgie française*, published in 1594, is a well-illustrated work which embodies all that was best in French surgery at the close of the century.

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PROBLEMS OF MIDDLE AGE

By A. T. WELFORD, M.A., *Director, The Nuffield Research Unit into Problems of Ageing, The Psychological Laboratory, Cambridge.*

RECENT studies of employment in relation to age have shown that as one passes up the age scale in industry one finds a rise in the proportion of men in managerial positions and of those doing unskilled labour and a fall in the proportion engaged in production work. The manner in which this comes about is fairly clear. The higher numbers of older people in management are due to the fact that promotion tends to be "through the ranks" so that it usually takes a substantial time to arrive at higher positions. For the shift from production to unskilled labour there seem to be two main reasons. First, the number of people taken on for work drops sharply after the twenties. It appears that during the twenties men tend to move from job to job until they find a niche in which they settle, so that in the higher age ranges there are fewer people wanting jobs. This, however, is not the whole story. Those who apply and still more those taken on for production work in the forties and fifties are fewer than ought to be available. The reason would appear to be partly that middle-aged people are unwilling to offer themselves for some jobs and partly that sometimes employers consciously or unconsciously discriminate against middle-aged applicants. This last is a delicate subject and it must be emphasised that there is at present not enough evidence to say whether the discrimination is just or unjust. It is all too easy to say that it is due to prejudice, but prejudices do not grow up out of nothing: they are almost certainly based on some experience at some time. It may be that experience of a few individuals in the past has hardened into a rigid policy which is unduly severe, or is applied too widely, but we do not know.

The second point to note about the shift from production work to unskilled labour is that it appears to go on to an extent which is not at all adequately revealed by labour turn-over figures. If we could study movements of labour in greater detail than the present factory records usually allow, we should find that in addition to the few men in the forties and upwards who change from one employer to another, there are a great

* Reprinted by courtesy of the *Nursing Mirror*.

many who change, often several times, from one job to another within the same factory. The reasons given are many and various, but there appear to be clear trends with age away from some kinds of work and towards others. Occasionally men are required to move by the factory authorities: more often it would seem the change is voluntary. The reason given is not always the true one—indeed, the true reason is often not consciously realised. A recent study has indicated that many men as they get older carry on with their jobs under an increasing strain. Then something happens—perhaps a trivial accident or a bout of 'flu—which keeps them away from work for two or three weeks, and when they go back they find that "something has snapped". They ask to change their job and they never change back. In such cases the change is often attributed to the illness or accident, but it is obvious that the true reason for it is of very much longer standing.

Changing Capacities

Although a great many exceptions and special cases undoubtedly occur, the hard core of evidence seems to lead us firmly to the conclusion that the trends of employment with age are due primarily to changing capacities of people as they get older, although the changes may act at second hand, so to speak, by giving rise to discriminative policies or unwillingness of older people to try their hand at particular jobs.

The problem then is what is the nature of the changes of capacity associated with age. One approach to this is to consider age distributions of people on industrial operations, classified according to the *type of demand* they make upon the people who work them. The results of one study in which this has been done have shown that if operations are divided into those in which there is *pressure for speed* and those in which there is opportunity for a somewhat slower tempo of work, the proportion of older people engaged on the former class is very much less than on the latter. Further analysis has since shown that this pressure for speed is of two types, one where some piece-rate system lays emphasis upon working as fast as possible all the time, the other where the work is rigidly paced by the machinery used, as for instance on many conveyor lines. Where the first of these types occurs the work appears to be difficult to learn after the twenties, so that middle-aged people are not taken on. Where the second type occurs older people seem to find it difficult to maintain the necessary pace, and people tend to move off to other jobs in the late forties and fifties.

Studies such as this indicate what happens in a general way to groups of people as they get older, but we must remember that the group trends imply changes in the individuals who make up the groups, and it is only by understanding these individual changes that we can fully understand

the problems of middle and old age. For this purpose we turn to experimental studies carried out in the laboratory, where the conditions and the various influences which affect a person's performance can be better controlled and sorted out than they can be in the field.

When we examine the results of experiments we find, in many different tasks, two striking trends associated with increase of age from the twenties onwards. Both are well known in old age, but both appear in fact to begin much earlier, often by the early thirties. The first of these is that as people get older they learn less readily. We cannot be sure on present evidence how far this is due to an inability to "register" anything new and how far it is due to interference from pre-existing knowledge, habits and so forth. When confronting a new task and seeking to understand it, there are inevitably brought to the present situation a number of guesses, presuppositions and expectations, based on past experience. It may be that these increase with age with the result that older people find it difficult to approach any new task with an open mind, and to set about understanding it without jumping to conclusions. They may be, as it were, bound by what they bring from the past and unable to get away to a fresh comprehension even though they know they ought to do so.

Stories that one is told in factories suggest that sometimes another source of difficulty for older people in learning is lack of self-confidence. When facing, for instance, unfamiliar machinery, they are unable to learn because they cannot bring themselves to try. Given encouragement and an opportunity to see what they can do without an audience, they can, at least sometimes, achieve a fully adequate standard.

The second striking experimental finding is that although older people tend to be either slower or less accurate than younger, the relationship of speed and accuracy to age is not entirely straightforward.

Many easy tasks, once they have been learnt, seem to be performed by older people quite as well as they are by younger. With more difficult tasks, there is usually some change with age. Slowing, when it occurs, appears to be not so much in the actual making of movements as in dealing with the information that comes in through the senses and deciding on the basis of this information what movements to make and how to make them.

It must, however, be emphasised that this loss of speed may not lead to a loss of achievement. Frequently together with loss of speed goes increased caution and as a result an *increase* of accuracy or a change of method of carrying out the task, which wholly or partly compensates for the loss of speed and tends to keep the overall achievement constant. Indeed, in many cases, in middle age over-compensation occurs so that despite the fact that changes of performance, continuous with those of extreme old age, have begun, achievement may actually be better than it is in younger

men. Peak average performances at industrial work are often in the thirties and forties, and strikingly good individual performances often occur very much later—at least up to the seventies.

Also it is clear that a skill can usually be well maintained far beyond the age at which the learning of it becomes very difficult. It has been suggested further that skills learnt early in life can be revived later in spite of having been allowed to lapse for a time, and that learning itself is a skill which can to some extent be maintained by use. However, on these two latter points the evidence is meagre and we cannot at present be certain.

Problems to be Studied

There are, indeed, very much larger areas of ignorance than of knowledge about what happens to skill as a person gets older. Some of the points about which we should like to know more have already been mentioned. Other pressing problems are:

1. Could older people be trained for new work more quickly with special training methods, and if so, what should these methods be?
2. The past experience brought to bear upon a new task seems sometimes to help and sometimes to hinder. We should like to know in precisely what circumstances each of these occurs and in what ways the first could be encouraged and the second removed.
3. To what extent can difficult conditions of work, such as rigid pacing, be borne by older people for short periods? In other words, is *any* stress of this kind contra-indicated for older people, or can they stand it if it is not *continuous*?
4. We know from a great many experiments that as one goes up the age scale, the variation between the performances of one individual and another at any given task tends to increase—often strikingly. We do not know, however, whether some general constitutional factor lies behind this finding, or whether it is due to the fact that if you give a task to a group of people, it is inevitably more in line with the past experience of some individuals than of others. If the first is correct, we may expect that as a man gets older, he will tend to remain competent at almost all tasks he may be given to do. If the second is correct, we may expect that as a man gets older he will remain competent at some things, although the range of things he can do well may become restricted.
5. Lastly, we know practically nothing yet in a scientific way about the changes with age of what may broadly be called wisdom. Indeed, wisdom is something which has never yet been adequately defined in psychological terms. It would, however, seem to be important to try to find out how it changes with age, because common observa-

tion leads one to believe that it is something in which older people have a very definite advantage over younger, and in the exercise of which they can make one of their most valuable contributions.

Some Present Indications

As regards practical recommendations, the evidence, so far as it goes at present, suggests that when later middle age sets in, work is likely to become a strain if it is carried out under conditions of rigid pacing. Where the pace is not too severe or is under the control of the worker and where he has scope to display care and accuracy to advantage, he is likely to do better. This appears to be true even though the work is fairly heavy. Heaviness appears not to be very important unless it reaches the point of strenuousness. Provided work is of a kind that can be borne without undue strain, it is probably better to carry on with a job that is familiar than to attempt a change. If a change has to be made, there must be reconciliation to a period of difficulty while getting to know the new job. This can possibly be mitigated by adequate preparation and by making some acquaintance with the new work before the definite change occurs.

Finally, one corollary of this may be mentioned. It seems that many of the hobbies which are urged upon old people who have retired are hardly the most suitable, because they involve learning skills which the people concerned have never practised before. The hobbies required would seem to be those which are already familiar. It should be noted that this places an onus on people to acquire while they are still young the interests and hobbies necessary to give them a full life after they have retired.

References

Most of what has been said in this article has been based on results of work by members of the Nuffield Research Unit into Problems of Ageing. Some of this work has been described in *Skill and Age: an experimental approach*, published recently for the Nuffield Foundation by the Oxford University Press. We are indebted to Dr. I. M. Richardson for the information at the end of the second paragraph, and to a number of firms for private communications. Reference is also made to work described in the following:

Sorenson, H. (1930) *Adult ages as a factor in learning*. Journal of Educational Psychology, **21**, 451.

Thomas, G. and Osborne, Barbara. *Older people and their employment*. Social Survey Report Nos. 150/1 and 150/2.

Wallace, J. G. *A study of labour turnover in a factory in relation to age*. British Journal of Industrial Medicine (to be published).

INDUSTRIAL ACCIDENTS*

PART II

By R. S. F. SCHILLING, M.D., D.P.H., D.I.H.,
Department of Occupational Health, University of Manchester.

Personal Factors Causing Accidents

Only a minority of all accidents can be ascribed solely to mechanical causes. In his Annual Report for 1918 the Chief Inspector of Factories said, " However well machinery may be guarded, we cannot look for more than a ten per cent. reduction in the accident rate by the provision of safeguards alone." Similar statements have been made by other Factory Inspectors in Great Britain and by observers in the United States. It is now accepted that if every machine or work situation is made as far as possible fool-proof there can still be many accidents. Man cannot be given absolute protection against the human element. The personal factors causing accidents may be temporary—arising from ill-health, due to fatigue, worry or sickness; or they may be caused by the irresponsibility and exuberance of youth or lack of experience. There is another group of people who are permanently clumsy, those whose "fingers are all thumbs." This condition was first studied by Greenwood and Woods (1919) who investigated the frequency of accidents in groups of women making shells in the first world war. All the women in each group were exposed to a similar degree of risk. It was found that many had no accidents, others had many more accidents than can be accounted for by chance. There were in a group of 648 women twenty-six who had three to five accidents. It was shown by statistical analysis that if the accidents had been distributed by simple chance only eight women would have had these multiple accidents. The excess was due to accident proneness. These observations have been confirmed in several studies of other workers, and the probable number of accident-prone workers ranges from ten to twenty-five per cent. in any group. One of the most fascinating studies of accident proneness was done by Farmer and Chambers (1939) on omnibus drivers, who are a highly selected group of men who have to pass a severe driving test before they are allowed to drive on the streets. The bus drivers who had three or more accidents in their first year had more accidents each year over a period of five years than those who were the safer drivers in the first year (Fig. 1). This and other studies show that the records of all accidents can be used to detect accident prone people. Such records in industry can be easily obtained from the treatment sheets if each worker

* Reprinted from **Journal for Industrial Nurses. 2** 4.

is given an individual card on which all his accidents and treatments for minor ailments are recorded. The latter may conveniently be kept on the back of the card. There is reliable evidence based on a number of studies that some accident-prone persons can be detected by æstheto-kinetic tests which measure the capacity to respond accurately within a controlled time interval to various sensory stimuli. They are valid only for prediction among skilled workers. The bus drivers who did worst in these tests had repeatedly during the five-year period more accidents than those who did best. (Fig. 2).

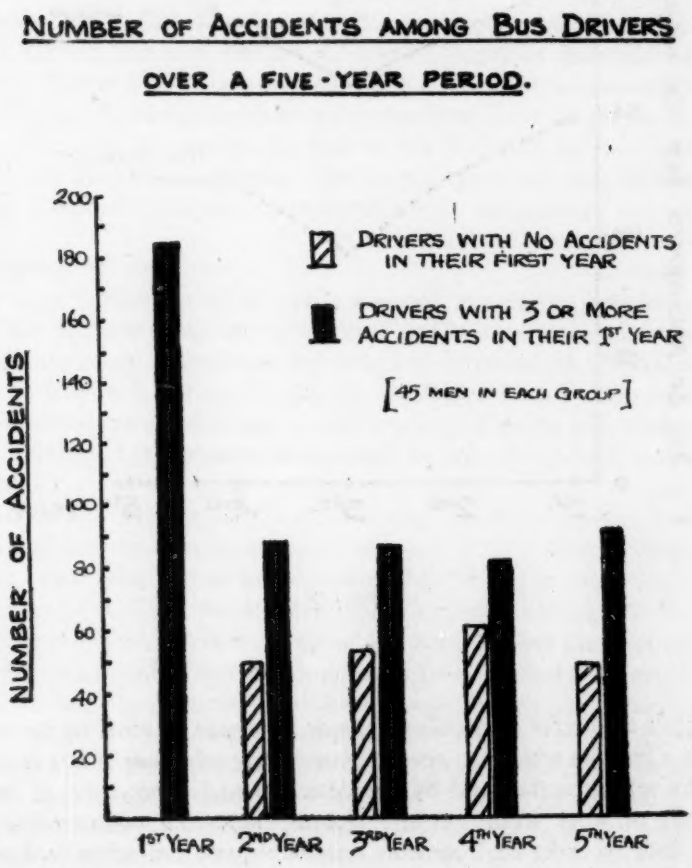

FIG. 1

MEAN ACCIDENT RATE IN CONSECUTIVE YEARS OF TOP AND BOTTOM INTERQUARTILE GROUPS IN THE ÆSTHETOKINETIC TESTS.
[LONDON OMNIBUS DRIVERS]

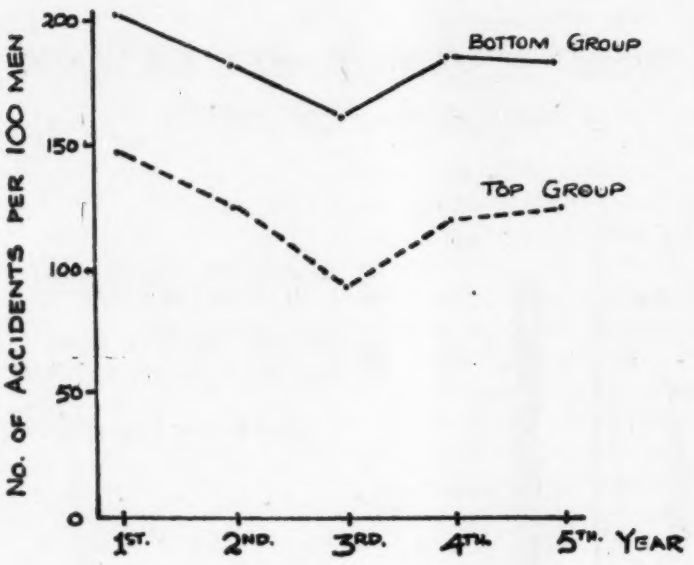

FIG. 2

Legge's axiom for controlling hazards by means external to the workman is a fine aim which can never be completely achieved. If it is assumed that by self-inspection and by the detection and elimination of unsafe methods of work from accident records, industrial communities can make their working environments reasonably safe but never fool-proof, the accidents which do occur will be mainly those caused by personal factors. Thus control of personal factors should offer the most likely chance of further success once defects in the physical environment have

been as far as possible controlled. The principles of controlling those personal factors will be placing work-people in tasks in which they are interested and for which they are physically and mentally suited. A boy with imagination who wants to be a draughtsman or an artist, but is put to work on a dangerous machine can be a menace to himself. A man with poor vision put to drive a crane can be a danger to his mates. Personal factors like poor vision, fatigue or even worry can often be corrected. Inexperience and the exuberance of youth can be prevented from causing accidents by training and supervision. The Factories Act (1937) introduced a new section (Section 21) which demands that no young person shall work at any machine prescribed as dangerous unless he has been fully instructed on its dangers and the precautions to be observed and has received sufficient training or is under adequate supervision. The adequacy of this training and supervision can to some extent be measured by the accident records of young persons. Once accident-prone persons have been detected the obvious step is to remove them from dangerous to safe work. This may be possible for youths but it cannot be for the adult worker who is skilled in a trade. There is no reason why they should not be told of their disability and possibly trained to overcome it.

Environmental Factors

The term "environment" is used in a narrow concept to include factors not of the machine or directly of the work itself. There are environmental factors such as air temperature, lighting, and length of the working spell, which are known to influence accidents. There are others, such as methods of payment, personal relationships with bosses and mates, which probably have an influence but whose effects cannot be or have not been accurately measured.

Osborne and Vernon (1922) showed that munition workers had the lowest accident rates at an air temperature of 67° F. The accident rate rose at lower and higher temperatures. At 52° F. it was thirty-five per cent. and at 77° F. twenty-three per cent. higher than at 67° F. The explanation given by Vernon is that at low temperatures the workers lose their dexerity because their hands get cold from contact with metal and fluids. At high temperatures there is less concentration and more fatigue. An interesting study by Vernon, Bedford and Warner (1931) showed the effect of temperatures in mines and the age of miners on accident frequency (Fig. 3). At the age of thirty-five temperature had the least effect, but for men above or below the age of thirty-five the relative accident frequency was higher in the hotter mines. Vernon's work (1918) on accident rates in relation to hours worked reveals the importance of fatigue as a cause of accidents. He found significant differences in the relative accident frequency of women working first a twelve-hour day and later a ten-hour

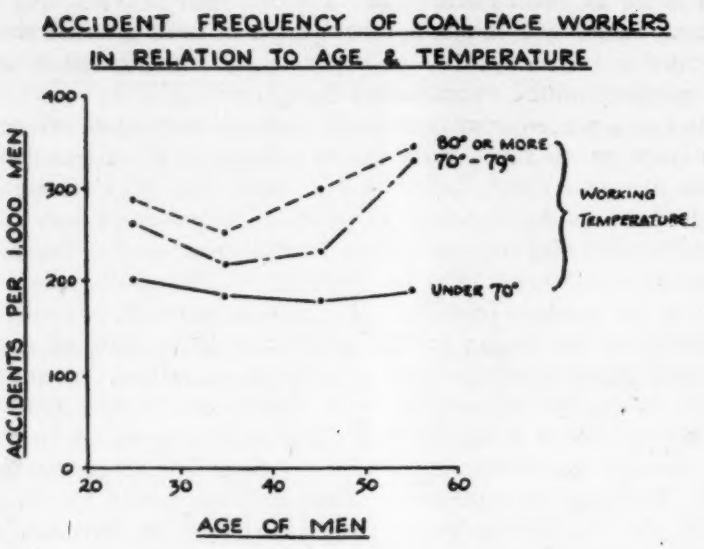

FIG. 3

day. During the twelve-hour day accidents were more than twice as numerous, if allowance is made for the longer hours worked, than they were during the shorter day. For the men there was little or no difference. These environmental factors are of some importance in the cause of accidents because they magnify the effects of the personal factors which are the most difficult to control.

Community Responsibility

Many industries employ their own safety officers who have the responsibility of both inspection of processes and correction of unsafe working methods. If the accident problem is not large enough for the appointment of a whole-time safety officer, there must be someone who has these responsibilities whatever the size of the firm. The appointment of a safety officer does not absolve other members of the community from any responsibility. Knowledge of causes of accidents and methods of prevention can come from the experience and ideas of everyone, and can best be integrated by democratic machinery such as a safety committee with representatives of higher management, foremen and workmen. In a factory where joint consultation is accepted as an essential part of industrial life, there is no indifference to accidents, nor is it accepted

that they are inevitable. A strong and healthy community protests against danger to its health and takes action to prevent it. An unhealthy community may regard its unhealthiness with indifference or anxious protestation without taking any action.

In an engineering works employing about 800 men it was observed that while output was rising the reportable accident rate was falling (Fig. 4).

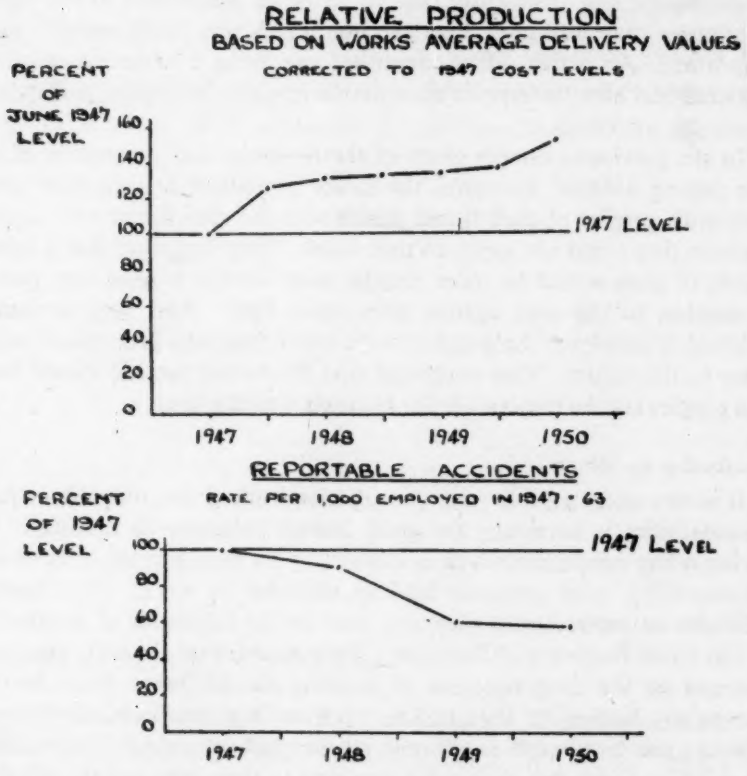

FIG. 4

Accidents in 1947 *were corrected to allow for three week's stoppage during the fuel crises. In* 1950 *the rate has been estimated on observed figures for ten months. Number employed increased from an average of* 805 *in* 1947 *to* 873 *in* 1950. *There was little fluctuation.*

Progressive improvements in the methods and conditions of work, and more overtime were all to some extent responsible for this higher output. But because of the longer hours and an increased availability of materials from better planning the accident risk in terms of time at work was increased.

The fall in accident rates coincides with a number of changes. A works safety committee was revived in the early months of 1948 and at the same time an industrial health service was established. Towards the end of 1948 a whole-time maintenance engineer was appointed and in the middle of 1949 a whole-time safety officer was added to his staff. All these changes undoubtedly had their effect, but of them all the revival of the safety committee may well have been the one which was fundamentally most important. An active safety committee can bring a wider range of experience and ideas to bear on the solution of safety problems, particularly from the workman.

In the previous example given of the detection and prevention of arc eye among welders' assistants, the safety committee first supplied these men with goggles of dark tinted glass which the men found were useless because they could not see to do their work. They suggested that a lighter shade of glass would be more suitable even though it gave only partial protection to the eyes against ultra-violet light. And they devised a method of supplying the goggles to the many men who give casual assistance to the welder. They suggested that the welder himself should keep the goggles and be responsible for his mate wearing them.

Attitudes to Work

It is now accepted that joint consultation leading to a measure of joint responsibility is necessary for good human relations in industry. An active safety committee which is allowed by its management to have this responsibility must promote healthy attitudes to work. Can healthy attitudes or social health play any part in the reduction of accidents?

The Chief Inspector of Factories (1945) records that the men who were engaged on the dangerous job of building the Mulberry Ports for the Normandy landing in 1944 had to work on high scaffolds, on exposed beaches, and under rush conditions; yet they had surprisingly low accident rates. They knew that their work was vital to their lives and the life they wanted to live. Their attitudes to their work were almost certainly healthy. Similar attitudes if less powerful in their effect can come from participation through joint consultation and responsibility. It is possible that the unexpected correlation between a declining accident rate and an increase in output shown in Fig. 4 is in some measure the result of better morale or social health as well as the tangible effect of a wider experience from the participation of the whole community.

Acknowledgements

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References

Chief Inspector of Factories (1945). *Annual Report for* 1944. Cmd. 6698. H.M.S.O., London.

Farmer, E., and Chambers, E. G. (1939). *Ind. Health Res. Board Rep.* No. 84. H.M.S.O., London.

Greenwood, M., and Woods, H. M. (1919). *Ind. Fatigue Res. Board Rep.* No. 4. H.M.S.O., London.

Osborne, E. E., and Vernon, H. M. (1922). *Ind. Fatigue Res. Board Rep.* No. 19. H.M.S.O., London.

Vernon, H. M., Bedford T., and Warner, G. G. (1931). *Ind. Health Res. Board Rep.* No. 62. H.M.S.O., London.

Vernon, H. M. (1918). *Health of Munition Workers Cttee.* Mans. No. 21. H.M.S.O., London.

BIOGRAPHICAL NOTES

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THE DECAY OF FAMILY LIFE

By H. MAINWARING HOLT, T.D., M.B., B.S., D.P.H. *Medical Officer of Health, Borough of Keighley.*

My family is entirely undistinguished. My father was a country doctor who practised in an agricultural district of the Yorkshire Wolds; my mother came of a family of soldiers.

Born in 1891, I was brought up in a typically Victorian household. Our pleasures were simple, a walk in the country was a treat usually reserved for those occasions when my father preferred it to the use of the horse and trap. Moreover it was an opportunity—a study of wild flowers as we met them in the country lanes would create within us a love of nature—and my sister and I trudged along in wonderment as he discoursed on this flower and that, the natural orders to which they belonged and why they claimed their places in the bewildering Linnean nomenclature.

We had a variety of friends. We entertained a mild contempt for those of acquired wealth; people who inherited their wealth were in a different category, rich through no fault of their own, and they were expected to disburse their money on every conceivable charitable object.

Our social callers included people of intellectual bent. The Vicar was a great friend. The local Florist was an authority on British mosses, a close friend of Alfred Russell Wallace and a Fellow of the Linnean Society. My great friend was a Sea Captain. I can recall many others, doctors, ministers and local officials, all of whom gave me kindliness and much good advice. How well I remember the Borough Engineer, who was also Water Engineer, Sewage Engineer, Director of Public Cleansing and Chief of the Fire Brigade. I can see his bearded countenance over the tea table now and hear his voice delivering in punctuated tone " 'I can't' did nothing, 'I'll try' did wonders, but 'I will do it' worked miracles". All was well, Queen Victoria was on the throne.

Then and Now

Such reminiscences of my own family life prompt me to reflect on family life as it is to-day. My father was strict, unforgiving, my mother kindly, God fearing, exemplary. I knew the penalty of disobedience, the importance of good manners, the necessity for industry and thrift.

The grim prospect of the workhouse and even prison itself were unequivocally portrayed as a dire consequence of any departure from the straight and narrow path which I must tread. All this has gone—as I believe, to the detriment of family life. There has been a slackening in the observance of traditional behaviour, clearly reflected in the relationships of everyday life.

The focus of happy family life was the festive board. Here common interests were discussed, the delights or difficulties of this and that, the prospect of the morrow. How important that the mistress should be a good cook and that the master should preside over all the lively gossip! Times have changed—to-day mother is at the works canteen, the children at school cramming down a meal of prescribed calorific value. When the day draws to its close, in they come tired and ready for bed; daylight saving has enabled them to play to the last minute. Gone are the days when they foregathered to listen to the fireside story or a reading from Hans Andersen.

Fifty years ago the whole family attended Church regularly, the Parson was a figure in the community, the family owed him a certain allegiance, the philosophy of his sermons prescribed a code of domestic conduct. It was an age of convention; divorce meant social ostracisation, illegitimacy was a horror, anyone who had to get married was never allowed to forget it. It seemed better to hide any moral weakness which one hadn't the courage to overcome, rather than display it to the whole world; to-day we dramatise our vices—falling in love with another man's wife is a common-place of the modern novel. To the Victorian such stuff would have been considered unfit to read, the decency of English tradition was worth preserving, the family was its stronghold and anything which might stir the Satanic embers was not tolerated. This outlook was by no means exclusive to the County family nor the middle class family, but was shared equally, if not more insistently, by the working class family.

The Victorian child was " to be seen and not heard." Obedience, consideration for others, politeness of speech, regular habits, frugality, thrift, were the foundation of upbringing and in prescribing these things the parent invariably enjoyed the strong support of the Parson.

The last fifty years have seen the development of the entertainment industry. Before its advent the family provided its own entertainment, with music, charades, the magic lantern and parlour games as features of the party programme. Public dances were exclusive affairs under distinguished patronage. Invitations were circulated to approved guests—to receive one was a mark of social recognition—evening dress was imperative, the presence of the chaperon sobered even the wildest heart. If you desired to dance with her protegée it was important to

impress her, for your every movement was well watched. Private dances were a regular feature of family life. In the less pretentious home the floor of the most convenient room was cleared of furniture, the piano manoeuvered into one corner and a pianist and violinist engaged, and the evening went its merry way, though all the usual formalities were strictly observed.

To-day outside amusement has acquired a degree of importance hitherto undreamed of. There is much that is new, greyhound racing, the dirt track, all-in wrestling, the football pool, an offshoot of professional football having very doubtful social value; the motor car has replaced the more leisurely horse and trap, the motor coach the wagonnette.

The economic changes of the past fifty years have profoundly influenced the integrity of the family, to-day the youth is able to go into the labour market and command a wage which makes him independent of parental control. There has been an enormous widening of opportunity for women both in industry and the professions; the married woman with a family is induced to leave her children in charge of strangers and enter the factory.

The absorption of female labour has resulted in the extinction of the domestic servant. Cases were not infrequent in which servants remained with the same family all their lives, sharing their hopes and fears, exercising an influence sometimes almost tyrannical, albeit indispensable to the completeness of the home. It may be argued that these people went out to service at the expense of their own family life, but this was no more the case than if they engaged in other service. Nursing, for example, was far more exacting. Why a girl should prefer work in a factory to well paid and no less honourable domestic work I cannot understand, for by serving her fellows in this capacity she would be doing far more good than by assisting in the manufacture of expensive millinery or cosmetics with which to feed their vanity, or by sorting the coupons of the football pool.

Reconstructing Family Life

It cannot be denied that certain material things are essential to man's spiritual contentment and physical well being. The problem, then, is to reconcile the established values of family life with recent economic change. The family is the repository of the qualities of our race, its countenance has been dimmed by the encroaching miasma of the welfare state. More and more is being done for the family by the State, children are brought into the world by the State, educated by the State in a manner which the State thinks best, their medical care is provided by the State, they will be employed by the State, the State will provide for their old age. Thus the initiative has shifted from the individual to the State. Over the years

the State has made provision after provision so that a considerable section of society is in danger of failing to recognise individual obligation altogether.

How is family life to be reconstructed in relation to modern economic developments? The State cannot stand aside. Above all it should provide houses within the reach of every married man and woman so that they may have the chance of establishing a traditional English home; it is due to their sense of independence that they be given the opportunity of owning it. Only under the most exceptional circumstances should married women be induced to enter the factory or workshop; on the housewife's presiding genius the success of home depends. There can be no doubt about that, yet it is strange that preparation for married responsibility is hardly ever contemplated. The Church does much and would do more were it not for modern apostasy and indifference. There is nothing which poisons the security of the family more surely than an irresponsible attitude to the married state.

Education has a place in this reconstruction. Mothercraft classes, cookery classes and the like have been instituted in many schools but the lapse of time between leaving school and matrimony is so considerable that a great deal of their value is lost. If education is important for children, further education is equally important for adults contemplating marriage. That the one should be compulsory and the other not has always seemed to me an anomaly.

The scientific approach to delinquency is suspect, and not infrequently the butt of public derision; little wonder, the problem has never been considered from the angle of prevention. For at least a generation it has been appreciated that the delinquent is a product of the broken home or of unwholesome family surroundings. Given a decent start in life the vast majority of families need not produce delinquents, but this can only come about by inculcating a proper approach to family life and contributing the material help under which its precepts may be brought to fruition. The art of living means making the best of one's own particular circumstances; happiness depends on the person himself not on things, not on furniture or household finery, not on having things done by others. " Better is a dinner of herbs where love is than a stalled ox and hatred therewith."

The results of two major wars have uprooted family life. Can anything be done about it? G. D. H. Cole has argued strongly in favour of a revival of the Parish, but there are counter arguments that no community spirit is possible in groupings of this size. I do not know that any greater advantage is to be gained from community spirit than family spirit, community spirit should be its natural out-come rather than an artificial growth promoted by social planners and busybodies of every conceivable

order. I do not want to make loyalty to family absolute and forget my responsibility to my village, to my Church or Nation but these considerations must be secondary or at best complementary, they must not conflict with the integrity of family life.

The family must remain the stronghold of our national character, we are learning from experience what happens to people who surrender their freedom for a promise of a more abundant life, we are beginning to realise that the renunciation of freedom means the acceptance of tyranny and the complete negation of self expression. Let us profit before it is too late.

BIOGRAPHICAL NOTES

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NUTRITION COMMENTARY

THERE is a suspicion that we may just be entering a period of renewed discussion about School Meals; and it is as well to consider here precisely what it is all about. During recent years a meals service has established itself in a large number of countries, including our own and the U.S.A. The article below, contributed by two American scientists, shows that workers in the U.S.A. are very conscious of the part that may be played by school meals in improving the food habits of a rising generation. This has been recognised over here; but we have not reached the stage where much is done about it.

School meals today

After a rapid growth during the war, school meals seem to have reached a static position. The reason for this is debated; but no sure solution has been found. Meanwhile, the whole nature of the service has been recently discussed in conferences of the teaching profession. The curiously static condition of the service is shown in the following table.

Percentage of children having school meals:—

1947	February	49.7%
	June	48.5%
	October	50.8%
1948	February	52.3%
	June	51.3%
	October	52.6%
1949	February	52.8%
	June	51.8%
	October	53.2%
1950	February	50.8%
	June	48.6%
	October	50.4%
1951	February	51.6%
	May	49.5%

There is a tendency for the percentage to fall slightly in the summer months. This may be due to the fact that a somewhat larger proportion

of children go home for dinner in the fine weather. But school absenteeism is higher in the winter months; and possibly it is a little less high among the meal children. In any case, the figures seem to have stabilised themselves. The higher price demanded for school meals may have dissuaded some parents; but there is no exact evidence of this. Again, the education authorities have established a certain income scale (usually estimated in relation to the number of children in the family) below which parents will be entitled to meals free or at part price. It does not appear that the demand for free meals has risen in any area, though one may suppose that many families would find themselves on enquiry entitled to some rebate. It is, however, important to realise that these scales do exist, even if they vary somewhat from area to area. Before the war most of the meals provided were free meals, at all events in the cities and towns. While at present there may be far less need for free meals to alleviate distress, we must recognise that, if distress grows again in any part of the country, we at least have the provision of free meals at school to fall back upon.

Frustrating influences

One of the delaying factors is undoubtedly the retardation of building schemes. This alone does not account for the whole problem, because there are probably a fair number of schools that could feed more children. But it has an effect in several ways. It has caused some of the authorities to limit the number of children who may apply for meals; and it has caused many teachers, who are of course especially concerned with supervising the children at their meals, to become very critical of the service. This is bound to have an influence upon the children. In the course of its history the service has passed through three well-marked but unequal stages. Before the war meals were mainly looked upon as a means of supplementing the diet of children too poorly nourished to take full advantage of their schooling. The teaching organisations, it must be noted, always took a leading part in advocating an extension of the service; for they realised the benefit to the children. Next, with the war, came the rapid growth of canteens. There was a vast amount of improvisation. School halls, class rooms, village halls and so on had to be used; meals had often to be taken in shifts. The prevailing war atmosphere, however, carried all before it.

Finally, at the close of the war, an Act of Parliament made school meals a permanent and universal service, later to be free of charge. Unfortunately, few at the time considered what this would imply. Teachers and administrators could not, of course, go on improvising for ever. They tacitly assumed that each school would soon have a well-designed dining hall and kitchen; and indeed the Ministry of Education made it

clear that, for instance, it would discontinue as soon as possible the fairly common practice of having meals cooked in a central kitchen and conveyed in containers to the schools. The dining hall and kitchen, spacious enough for their purpose and tastefully decorated, would become a recognised part of the school; they would be so planned as not to interfere with the normal school curriculum.

No one concerned with school meals expected this to happen in a moment; but it was expected that there would be steady and obvious progress. One has, however, a suspicion that many of our legislators, when they passed the Act authorising the service of school meals, were still thinking of the meals as a philanthropic safeguard for poorly nourished children; while they recognised what the service would cost the Exchequer, they did not understand what a frustrating effect an improvised meal service can have upon a school in normal times of peace.

The Educational Aspect

There is no doubt that school meals should be considered as educational and cultural in their purpose. The dining hall is part of the school; If the building programme is to be slowed down, it may be long before the dining halls in many of our schools become the pleasant cultural centres they should be. In that case it seems desirable that the authorities should admit the fact and do what they can to improve matters. In the first place, there should be established in all areas of the country a number of good "model" dining halls and kitchens. These will at least serve to show the teaching profession and the public the kind of service at which we are aiming. Opportunities should be given for teachers to visit such "model" establishments. Secondly, means should be found for publicising the rate of progress and explaining frankly why the rate of development is slower than was once hoped. If the reasons for delay are good, and if a gradual but definite progress is achieved, the public will recognise the need for patience. Thirdly, efforts might be made to improve the meal amenities in a large number of schools.

If these steps are not taken, the service will suffer. Much had been done to improve the system of costs accountancy in the canteens and to advance the training of kitchen staffs in food preparation and kitchen hygiene; but it is on the dining hall side of the serving hatch that we need to make progress.

Factors in Education

Here we meet the difficulty that the school meal cannot play its full educational part, unless the meals are taken under satisfactory conditions. It has been pointed out that the service has three main educational functions to fulfil.

1. It assists to mould the tastes of the coming generation. Enquiries made among adolescents in industry have suggested that even now the service is doing this; many of them retain their liking for milk as a beverage, and a surprising number seem now to have acquired the habit of eating salads and other valuable dishes.

2. In a country like our own, that has to import so large a proportion of its food, it may become necessary to accustom people to new foods and combinations of foods; and in that case the actual eating of school meals could be associated with instruction to the children on our food and its sources.

3. If we wish to train children to be co-operative, helpful and sociable, we cannot do so better than through the common meal table. We live in a world with increasing social activities outside the home; and it is desirable to train children to be easy-mannered and domesticated in company.

It is doubtful, however, whether the service will exert its full influence until it also interests the parents; and this will not happen until it is realised that the school kitchen could act as an educational centre in a neighbourhood. Occasionally something is done through parent-teacher associations to inform mothers about the school dietary or to plan cooking demonstrations. But far more needs to be done, since the school meal is clearly one of the best methods of linking home and school more closely together.

Uneven Growth

A few final comments may be made on the service as a whole. The development is by no means even throughout the country. As the table below shows, the country areas are usually in advance of the cities and towns; and this may be accounted for partly by the distance from school to be walked by many rural children. Often an authority seems to have maintained the relative position it held during the war, as though some of them had never recovered from the early slowness of progress. Some of the Welsh county authorities hold the foremost position; and these show what can be achieved under difficult conditions.

Percentage of children taking school meals

February 1951	
English counties	56.8%
Welsh counties	58.1%
English boroughs	41.5%
Welsh boroughs	36.3%

NUTRITION EDUCATION

By F. EUGENIA WHITEHEAD, D.Sc., and FREDRICK J. STARE, M.D., *Department of Nutrition, Harvard School of Public Health, Boston, Mass.*

THE Department of Nutrition at the Harvard School of Public Health, Boston, has had an active programme of research in nutrition education in the public schools since 1943*. It is based on the premise that there is more of an opportunity to improve the nutritional practices of large groups of people by concentrating nutrition educational activities on children rather than on adults. The latter generally have pretty well fixed dietary patterns; children, particularly young ones, are still forming food habits. Furthermore, the public schools offer a means of reaching a large percentage of the coming generation. Other premises in our studies have been that for a programme of nutrition education to be practical it must be integrated into the ordinary courses given in every public school, the integration and actual teaching must be done by the usual school teachers, and to be effective it must be taught gradually and to some extent every year of the school career. Yearly exposure from kindergarten through the last year of high school to an over-all plan of nutrition given as part of instruction in "reading, writing, and arithmetic" would be expected to give more lasting results than nutrition instruction given once or twice during the entire schooling years in a hygiene or biology course. It is important to remember that we are thinking of education of all boys and girls with respect to nutrition in health, both individual health and world health.

With these thoughts in mind, research studies were begun in the public schools of Newton, Massachusetts. One of the results was a brief publication entitled *Goals for Nutrition Education in the Elementary and Secondary Schools*, which attempts to outline the ideas or goals one ought to try to put across at the various grade levels so as to give a good coverage of the subject of nutrition over the entire period of elementary and secondary education. Two other publications, *Activities in Nutrition Education for Kindergarten through Sixth Grade* and *Activities in Nutrition*

* Supported in part by grants-in-aid from the Nutrition Foundation, Inc., New York, and Swift & Company, Chicago.

Education—Junior and Senior. High School, give specific activities that have been found useful in putting across the "ideas or goals" for the over-all programme [1].

From the public schools of Newton, a typical, large-city, residential, suburban area in Eastern United States, the research activities were transferred to two rural, county school systems in the central and southern United States—Rutherford County, Tennessee, and Ascension Parish, Louisiana.

The Ascension Parish Study

This study began in 1944* for the purpose of discovering ways to teach nutrition effectively, and it was directed toward getting groups to improve their food habits. The emphasis was placed upon what groups do about food rather than upon what they know about food. It is recognised that improvement of good habits often depends upon several factors and that the assessment of specific influence is difficult. The problem here was to bring about improvement through nutrition education.

It was believed necessary to find out what the food habits were in order to plan expediently for a programme of improvement. This was approached by working with public school leaders to conduct a survey which involved every teacher and every school-age child in Ascension Parish. They kept records of what they ate for seven consecutive days. The records were scored in terms of the number of servings of protective food eaten for the week, and those showing a daily average of 14 or more such servings were arbitrarily rated as good, those with a daily average of 8 to 13 were rated as fair, and those with a daily average of 7 or less were rated as poor [2].

A second analysis of the records was made for the purpose of counting the number of times these foods were eaten: (1) milk, (2) eggs, (3) fruit, (non-citrus), (4) fruit (citrus), (5) meat (lean), (6) whole grain products, (7) butter or enriched margarine, (8) potatoes (Irish and sweet), (9) green, leafy vegetables, and (10) other vegetables.

The initial survey of food habits of 1,529 school-age children in Ascension Parish, Louisiana, shows that only 1.5 per cent. of them had food habits which were rated as good, 57 per cent. had food habits rated as fair, and 41.5 per cent. had food habits rated as poor. Obviously, these children's food habits were not consistent with recommendations made by the National Research Council [3], and the most outstanding needs for improving their food habits were: (1) to double the consumption of milk, eggs, non-citrus fruits and potatoes, (2) to triple the intake of citrus

* Supported by a grant from the General Education Board to Louisiana State University for two years, 1944-46, and by State appropriations 1946-48.

fruit and other sources of ascorbic acid, and (3) to increase the intake of whole grain cereals, butter or margarine, and green, leafy vegetables four or five times.

The Teaching Programme

Since it is sound to teach on the basis of need, and since several nutrition-education needs had been clearly discovered by the survey of food habits, alert teachers immediately saw what they needed to teach, not only in classrooms but also in school lunch programmes and in the community. Ascension Parish is located in a potentially rich agricultural area where strawberries and citrus fruits are produced abundantly, and where gardens may be cultivated about ten months of the year. The job to be done was indeed a matter of education.

Teacher committees were organised in each of the five schools within the research project to work with pupils, teachers, school lunch personnel, parents and community leaders in improving food habits. Each committee set up specific objectives and made plans to acquaint the children and the parents with the findings revealed by the food habits survey [4]. They developed programmes which included such activities as: teaching-units on milk, citrus fruits, eggs, and whole grain products, as well as green, leafy vegetables, and school gardens ; serving a rich source of vitamin C in the school lunch every day, and whole wheat bread and half a pint of milk with the plate lunch for every child at school; teaching children, parents, and school lunch managers to evaluate their own food habits by counting the 'points' (one point for each serving of protective food) they ate at each meal; and teaching children and parents to produce, purchase and prepare food properly. These and many other activities were correlated with other subjects, such as spelling, reading, arithmetic, science, agriculture, home economics, and social studies, in ways whereby nutrition became a part of the regular school curriculum rather than an "extra" subject to be added to an already crowded school day.

At the end of the year, the teacher committees held an evaluation meeting to determine how far they had progressed toward their objectives and what next steps needed to be taken in the new school year. Gradually the supervision of the teacher committees shifted from the director of the research project to the newly appointed Supervisor of School Lunches and Health Education. After almost two years of jointly sharing the leadership responsibilities for the nutrition education programme, the full responsibility was assumed by the local supervisor. Repeated appraisals of food habits were made annually to evaluate the effectiveness of the nutrition education activities promoted by the teacher committees[5].

Results

When the 1947 food habits survey was made, there was considerable improvement indicated. The percentage of children having food habits rated as good increased from 1.5 in the initial survey to 25.4, after almost three years of nutrition education effort. The percentage in the fair groups was 57 in 1944 as compared with 67.1 in 1947, and the percentage of children having poor food habits was decreased from 41.5 in 1944 to 7.5 in 1947. The increased intakes of certain food groups is shown in Table I. It is seen that in this three-year period there has been a considerable increase in the consumption of all of the foods in these groups, with milk consumption increasing from 46 to 57 per cent., and green leafy vegetables more than doubling, increasing from 18 to 47 per cent.

Briefly this describes the principal features of the Ascension Parish programme developed during the school years 1944 through 1948.

Following that period (1944-1948), the continuation of the programme depended upon local leadership. Recently (December, 1950) a re-survey of food habits was made to determine whether or not the programme developed in 1944-1948 had any carry-over value. In other words, were the methods and procedures used in this project of nutrition education effective enough to sustain interest and promote improved food habits after the project supervision had been withdrawn for as long as a three-year period?

Preliminary treatment of data indicates that interest on the part of school leaders especially was not only sustained but increased, as judged by physical improvements in school lunch rooms as well as by marked improvement in the quality of meals served at school. That their efforts have had far-reaching effect into the community was indicated by reports from store managers who said they had increases in sales of such foods as milk, oatmeal, and whole wheat bread last year—this from stores where few of these items could be purchased in 1944.

Furthermore, evidence that good nutritional practices were still being encouraged in committees as well as through classroom instruction was found not only in the high quality of lunches served but also in the fact that the food habits appraisal showed improved intakes of nearly all food groups considered in this study.

Conclusions

Results of these studies permit the following conclusions: (1) Leaders within schools and communities support and sustain nutrition education when they have an active part in the planning and evaluation of their own programmes. (2) Food habits can be improved by nutrition education if it is based upon needs of the group, if the group is made cognisant of its needs, and if the nutrition education is integrated into the regular

curriculum of the schools. (3) Organised teacher committees afford an effective medium for developing and continuing a programme of nutrition education when they are guided to accept the responsibility of that programme, realise the importance of good nutrition in good health, and maintain an experimental attitude toward solving their own problems.

TABLE I.
COMPARISON OF FOOD INTAKES OF SCHOOL-AGE CHILDREN, ASCENSION PARISH, LOUISIANA, 1944 AND 1947.

Food Group.	*Weighted Percentage of Recommended Standard Consumed.*	
	1944	1947
Milk	46	57
Eggs	50	76
Fruit (non-citrus)	56	76
Fruit (citrus) ..	35	60
Meat (lean only) ..	109	124
Whole Grain Products	29	84
Butter (and margarine)	23	40
Potatoes (Irish and sweet)	57	91
Green Leafy Vegetables	18	47
Other Vegetables ..	110	123

References

1 These publications are available from The Nutrition Foundation, Inc., Chrysler Building, New York, New York, at cost. Goals, $0.15; Activities for Elementary Schools, $1.00; Activities for High School, $1.00.

2 Whitehead, F. E., *Appraising Food Habits—An Evaluation Device with Suggested Procedures for Classroom Teachers*, Bureau of Educational Materials, Statistics, and Research, Louisiana State University, Baton Rouge, Louisiana.

3 National Research Council, Food and Nutrition Board, *Recommended Dietary Allowances*, Revised, Reprint and Circ. Series 122, August, 1945.

4 "Report of the Third School Work Conference of Ascension Parish," Bulletin No. 598, Louisiana State Department of Education, p. 26-36, 1945.

5 Whitehead, F. E., *Research in Nutrition Education*, J. Amer. Dietetic Assoc., Vol. 23, No. 4, April, 1947.

MILK KITCHENS AND FEED PREPARATION

By V. SHENNAN, S.R.N.,
Health Tutor, Worcestershire County Council.

THE equipment of a milk room, or kitchen, where feeds are to be prepared for infants, is a matter of considerable importance. Careful planning on the part of all who are responsible for the conversion of existing premises or the building of new ones would give a far greater degree of efficiency in this department, upon which the health, and even the lives, of the infants to be cared for under residential conditions, may depend. Much thought is often given to the provision of adequate space, ventilation, and equipment elsewhere in the building, and great care taken over the arrangements for toilet and laundry provision, but this degree of attention often stops short at the milk kitchen.

In the past, accommodation for children under the age of two years has varied a good deal. During the war years, particularly, when conversion of premises, often unsuitable, was the rule rather than the exception, many buildings were used to house infants which were far from ideal. Their unsuitability in some respects did not prevent them from being able to provide adequate care in most aspects, though the milk kitchen accommodation was usually extremely poor. Any small room which could be equipped with a sink and gas ring was allocated for the purpose and the staff left to prepare feeds as best they could under these conditions. That outbreaks of enteritis were not more common was certainly due to the intelligence and constant care with which these premises were used by the nursing staff.

When money is being spent on providing equipment for the care of these young children, it is highly desirable to spare a thought about what constitutes an ideal milk kitchen, and how much of the funds available should be allocated for this purpose.

Choice of Room

Size must be the first consideration. In a nursery for thirty children, it is safe to estimate that ten may be bottle fed, or on special weaning diets which should be prepared in the milk room. Granted this, it is evident that two people will need to work in the room preparing feeds. If these are student nursery nurses, a member of the trained staff must often be

present to teach and supervise and it will, therefore, be seen that a fair sized room will be needed, if bacterial contamination from the products of respiration is not to become a serious problem, since all feeds must be made up with windows closed. Masks do not cut out entirely the risk of possible infection of milk from respiratory sources.

The outlook should be bright, unblocked by walls. Modern refrigeration renders the dark, north aspect unnecessary. Good lighting, both natural and artificial is essential. White tiles on facing walls may be needed to throw back light if no other choice of room is possible.

The room should not be situated leading from a passage where there is a good deal of traffic, as near a garden door. It should never be anywhere near toilet or bathrooms.

Ventilation must be adequate. Hopper ventilators are perhaps best, since they tend to admit less dust than the casement window, and the room must be thoroughly ventilated at all periods of the day when feeds are not actually being prepared.

Equipment

Funds available govern the amount to be spent on equipment, but some articles should have priority. An adequately large refrigerator must take first place. Assuming a total of ten bottle fed infants, if the feeds are to be made up for 24 hours, the refrigerator will have to store ten wire baskets to hold six feeds, as well as any other prepared foods, and provision must be made for this.

A double sink, with draining boards on both sides at least three feet long, is essential. If funds allow the second sink should be fitted with steam or electric sterilising equipment. Large-scale caterers have a variety of apparatus of this type and a visit to suppliers would be informative. There should be a hand basin for the routine scrubbing of hands and nails, as it is undesirable that this should take place in the sink for washing up. A constant supply of very hot water is essential and an alternative system for heating water is an advantage in case of fuel or power cuts.

The steriliser for bottles need not be larger than one able to deal with one dozen bottles at a time, since bottles should be filled as soon as possible after removal from the steriliser, not left covered with muslin or metal covers for any length of time.

A cooker of some kind will be needed, and an electric one is best since it is fumeless and smokeless.

The walls should be tiled for at least four feet from the floor and lighting fitments made flush in the ceiling or walls. The lights must be placed to give maximum benefit over working surfaces. Fluorescent lighting gives good shadow-proof light. The floor should be of water

resistant material with corners rounded off at the skirting.

Working surfaces, tables or counters, should be finished with a hard, plastic surface to allow of constant washing. Cupboards and shelves should be made flush, without mouldings, and are best fronted with glass so that contents and possible dust can be seen.

An adequate supply of dishtowels, hand towels, cloths, muslin covers and mops, to allow of frequent sterilisation, should be provided.

General equipment can be selected to personal choice. Pyrex upright bottles and glass basins for mixing and containing puree feeds are recommended. Glazed china jugs to contain bottles to be heated are better than enamelled iron, which chips and becomes rusty in use. Small individual sterilisers made of light metal alloy are best for sterilising and storing teats.

Some facilities for the laundering of milk kitchen equipment should be provided, separate from the arrangements for normal nursery laundry. All cloths, covers and dishtowels used in the milk rooms should be washed and ironed separately from the household wash. This is best done in a small room adjoining the kitchen, equipped with sink, boiler and electric iron. If this is not available these articles must be dealt with in the milk kitchen. Under no circumstances should they be washed with bed linen, napkins or articles of clothing.

Technique of Feed Making

There are many methods of making feeds, but certain principles should be common to all methods. The doors and windows should be closed, and the nurse who is to make the feeds should wear a gown which covers her uniform completely, and a mask. Before making feeds hands and forearms must be thoroughly washed. Once the operators are in the kitchen the doors should be closed and no one else admitted.

When fresh cow's milk is used for feeding, raw cow's milk should be obtained from a reliable local source, and if possible Tuberculin tested milk should be used. All milk must be boiled immediately upon arrival, rapidly cooled, and stored in the refrigerator. Since the milk must be boiled there is little point in obtaining pasteurised milk, which is often three days old on delivery.

When dried milk is used the tins should be marked with the date of purchase, stored in dated order and used as quickly as possible once opened. Tins must be kept tightly closed, and long handled measures should be used for measuring feeds to avoid the need for hands constantly entering the tin.

Soft brown sugar is commonly advised for feeds, and if this is used it must be boiled with the water which is to dilute the feed. This sugar is usually stored in the shop in sacks or bags and is very liable to con-

tamination by animals. Boxed castor sugar is probably the safest.

All water must be boiled and should be used directly from the kettle, not poured into jugs and stored as boiled water.

If many feeds are made up together the need to label them may present a problem for the sterilising technique. Nothing should be fixed to the bottle neck for purposes of identification which cannot be removed for boiling. Lengths of coloured plastic covered wire can be used to mark bottles and this is readily removable.

When the bottles have been filled they should immediately be covered with glass or metal caps which can be sterilised by boiling, and placed at once in the refrigerator. Corks should not be used. Nothing should be introduced into the neck of the bottle once the feed is in it, and thermometers must not be used to test temperature.

When a feed is required it is advisable to boil a kettle of water, place the teat on the bottle in the milk kitchen after previous scrubbing of hands, stand the bottle in a one pint jug and pour the boiling water over the teat. The teat should then be covered with the bottletop, the feed carried covered on a tray to the child. Teats should not be put on the bottle in the room where the child is being fed nor should the teat be changed during the feed, for the possibilities of contaminating the teat are greater once the nurse is also handling the child.

The bottlecaps are small metal cups about 2 inches deep completely covering the teat and fitting snugly round the bottle neck. Miniature jam jars or plastic egg cups may be suitable if they fulfil these conditions. Plastic must be sterilised by chlorination as it cannot be boiled.

After use both bottle and teat must be immediately cleaned by any of the usual methods, using detergents to remove grease. They should be thoroughly rinsed, and stored to await sterilisation before the feeds are made again.

Given the ideal milk kitchen detailed in the opening paragraphs, the technique of feed making should present few difficulties.

Summary

In nurseries where children aged 0-2 years are cared for, the risk of infections of the intestinal tract is an ever present danger. An efficient department for making feeds is the best safeguard, and money spent on the equipment for this department could not be put to any better use for the health and well-being of the children. Pleasant working conditions also produce greater efficiency from the staff, this aspect being of particular value when students are to be instructed in the principles of making feeds for infants. It is difficult to impress the importance of absolute cleanliness in the technique of feed making, if the milk kitchen is not designed to produce the necessary standards of hygiene and efficiency.

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FILMS

WE WANT A CHILD. 35 mm. Sound. Black and White. 1 hour 45 mins. On commercial terms from Renown Pictures Corporation Ltd., 54/58, Wardour Street, London, W.1.

This excellent film has been produced in Denmark for showing in the public cinema to warn audiences of the dangers and undesirability of abortion. It won a gold medal award at the Film Festival in Venice during 1950. A clear and attractive English dialogue is provided.

Else and Leif are married and both ardently desire a child, but none results from their marriage. Else confesses to her doctor that during the war she had an abortion, and he explains the dangers and says there is little hope of her ever having a child.

Jytte, her best friend, visits the same doctor because she is expecting an illegitimate child, and asks for an abortion. She is dissuaded and Else agrees to adopt the baby, but when the time comes Jytte refuses to part with it. However, Else finally conceives a baby of her own and is instructed in pre-natal care. The birth of the baby is shown.

Throughout, the story is human and interesting, the production is first-rate and the background music pleasant and unobtrusive.

The film is very suitable for the public cinema and can be highly recommended to all types of social workers. L.E.H.

DIGESTION OF FOODS. 16 mm. Sound. Black and White. 11 mins. British spoken commentary on American film. On sale or hire from Lexicon Films Ltd. 123, Pall Mall, London, S.W.1.

By means of straight photography and animated diagrams, this film deals with the digestion of food in the mouth, stomach and small intestines. Simple experiments with digestive juices are shown e.g. the action of saliva on starch, of gastric juice on white of egg, of bile and pancreatic juice on cream. Finally, the end products enter the blood and lymph, and water is absorbed by the small intestine.

This is a remarkably clear, well produced and well photographed film which covers a very large field in a very short time. It could be recommended to sixth form biology students, pre-nursing students and dietitians, especially for revision. L.E.H.

FOODS AND NUTRITION. 16 mm. Sound. Black and White. 10 mins. British spoken commentary on American film. On sale or hire from Lexicon Films Ltd. 123, Pall Mall, London, S.W.1.

This film is intended for use with senior secondary school pupils and adult audiences such as nurses, health visitors and dietitians. Diagrams show the average daily dietary requirements for a man of carbohydrates, proteins, fats, minerals, vitamins and water. Animated diagrams show the absorption and transformation of sugars and the absorption and storage of fats. The metabolism of carbohydrates, fats and proteins is dealt with in an elementary manner, and the calculation of basal metabolism rate by means of estimated surface area is explained. Diet deficiency diseases result from laboratory experiments.

The film is well produced and the commentary is clear, but it could only be used satisfactorily as revision, because so much information is presented during ten minutes running time. The subject could profitably have been extended to three or four separate films of the same length. However, it serves a useful purpose for the audiences for which it was intended. L.E.H.

BOOK REVIEWS

THE COMMON SENSE OF SCIENCE, by J. Bronowski. (Wm. Heinemann Ltd., Contemporary Science Series. 1951. Pp. 154. Price 8s. 6d.)

Last year I was listening to a wireless programme with a group of actors and actresses. The programme ended and J. Z. Young began one of his Reith lectures. "Oh, turn him off," an intelligent middle-aged actress said, "He wants to blow us all up." Experience shows us that today artists misunderstand scientists and are deeply unaware of what they are trying to do. Conversely scientists often fail to understand their artist contemporaries; and both of them are liable to be separated by wide gulfs from the masses of the people.

It is part of the purpose of Dr. Bronowski's short book to link together artists, scientists and the common man. He shows that in several ways the gap between art and science has become needlessly wide. For example, the same type of mind can succeed in the arts or in the sciences. A man like Christopher Wren could be a great architect and a professional astronomer. Even today a gifted boy may have to choose between an artistic and a scientific career. Sir Robert Watson Watt, for instance, showed at school so much talent for writing that his headmaster wanted him to take it up as a career.

Science also affects art by creating the conditions that allow us to develop new sensibilities. By putting the argument in the following words, "It was the engine, it was the horsepower which created consideration for the horse; and the Industrial Revolution which created our sensibility," Dr. Bronowski brings to mind, in confirmation of his case, the words of William Blake, written in that very Industrial Revolution:

"A horse misused upon the road
Calls to Heaven for human blood."

Sensibility to the rights of animals and to the brotherhood of man is permitted by the machines that release us from the harshest extremes of manual labour. And some have said, sometimes in apology for its use in destructive warfare, that science is no more than a machine or a tool, without morality. Dr. Bronowski brilliantly states the contrary case, that the practice of science is a moral activity. He brings out clearly the sometimes forgotten fact that the practice of science involves moral values, such as regard for truth, for freedom of thought and of expression, and a constructive attitude towards mistakes. The scientist sees mistakes, for instance, as necessary features of the learning process, which lead to a better understanding and possibly to new discoveries. Appropriately it is again William Blake, whom we might consider as the moralist of the Industrial Revolution, who clearly expressed this attitude in several of his Proverbs of Hell. For example: "If the fool would persist in his folly he would become wise."

Since the core of scientific values is regard for truth, it is useful to define what scientists mean by truth. William Clifford, whom Dr. Bronowski quotes, provides one of the best answers: "The truth at which it (scientific knowledge) arrives is not that which we can ideally contemplate without error, but that which we may act upon without fear." It follows, as Dr. Bronowski puts it, that "Science itself is a predictor mechanism in process of continual self-correction."

With *The Common Sense of Science* Dr. Bronowski introduces the "Contemporary Science Series," of which he is general editor. Since this book deals broadly with fundamental issues it should provide a good starting point for a series whose later volumes may be expected to cover narrower fields in greater detail.

H. O. J. COLLIER.

INFANT FEEDING AND FEEDING DIFFICULTIES, by Philip Evans and Ronald Mackeith (J. & A. Churchill Ltd. 1951. Pp. 256 Illus. Price 12s. 6d.).

It is a very pleasant surprise to find a book on Infant Feeding which devotes only 8 of its clearly-written, well-illustrated pages to artificial feeding, and gives 60 to the study of the physiology and management of breast feeding.

The chapter "General Considerations" at the beginning of the section on breast-feeding is a timely reminder that there is now a considerable body of evidence as to the benefits which the breast-fed child enjoys, and the added risks to which artificial feeding exposes the unwary.

Even more valuable, however, is the wisdom, the cool selective judgement and the refusal to be "carried away" by any particular theory which characterise the book throughout.

The authors do achieve what they set out to do—to make infant feeding seem a common-sense business, well within the powers of any mother if only "one knows one's facts and keeps one's head."

Anyone responsible for the guidance of the expectant and nursing mother should read this book, if only for the pleasure of its condensed clarity of expression.

ANNE BURGESS.

50,000 OUTSIDE THE LAW (National Council for Civil Liberties, 46 Westbourne Grove, London, W.2. 1951. Pp. 40. Price 1s. 3d.)

This booklet purports to be "An examination of the treatment of those certified as mental defectives", and it has received considerable notice in the national press. It is the result of an investigation into the cases of over 200 persons who sought the assistance of the N.C.C.L. alleging that they were either wrongfully certified or needlessly detained in institutions for the mentally defective. The Council claims that as a result of their efforts for this section of the underprivileged a number of patients have secured their discharge.

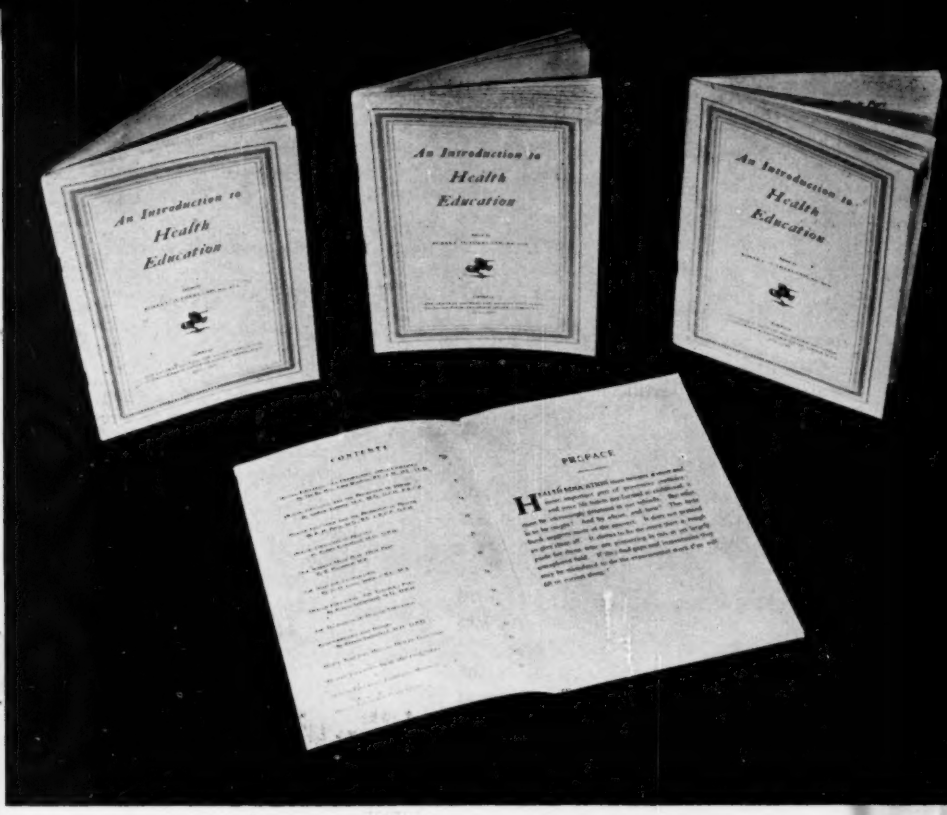
Some critics of the pamphlet have referred to its emotional method of presentation and have said that it only deals with alleged evils and thus gives an unbalanced picture of the present situation. But its avowed aim is to focus attention on what the Council calls "one of the gravest social scandals of the twentieth century," and they urge a public inquiry into the present state of affairs.

Mental deficiency is a subject of which most people have little experience, and it is too often treated jestingly. The pamphlet quotes authentic cases and also some letters written by defectives which will give the reader a glimpse of the human background of this difficult problem.

L. T. HILLIARD.

YOUR FACTORY AND THE LAW, by Francis W. Hunt. (Seven Oaks Press Ltd., 165 Victoria Street, London, S.W.1. 1951. Pp. 156. Price 15s.).

The author, who has forty years of experience as a Factory Inspector, has summarised factory law in all its branches and made comments on interpretation. Though the book is designed for management, the concise presentation and readable style make it of great value to the industrial medical officer and nurse as well as to the student of public and industrial health.

JOHN BURTON.

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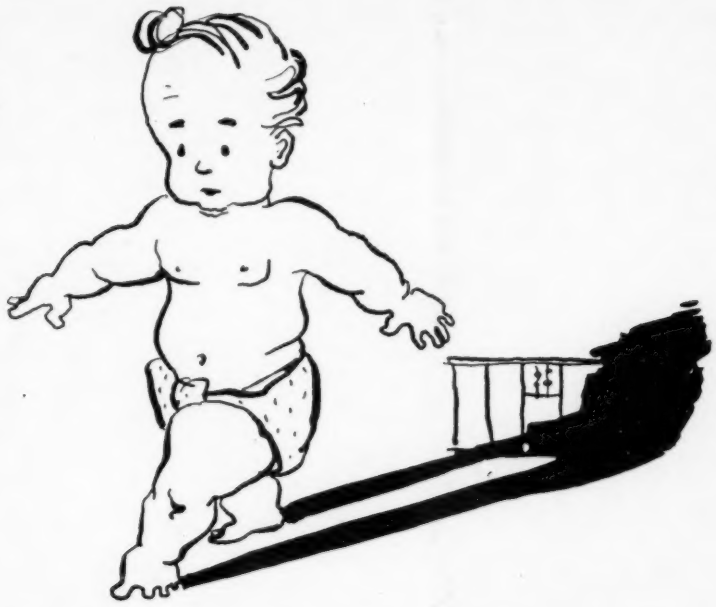

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